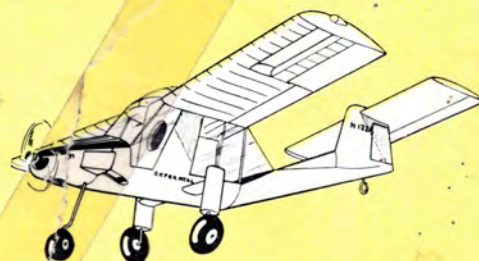


Air Trails

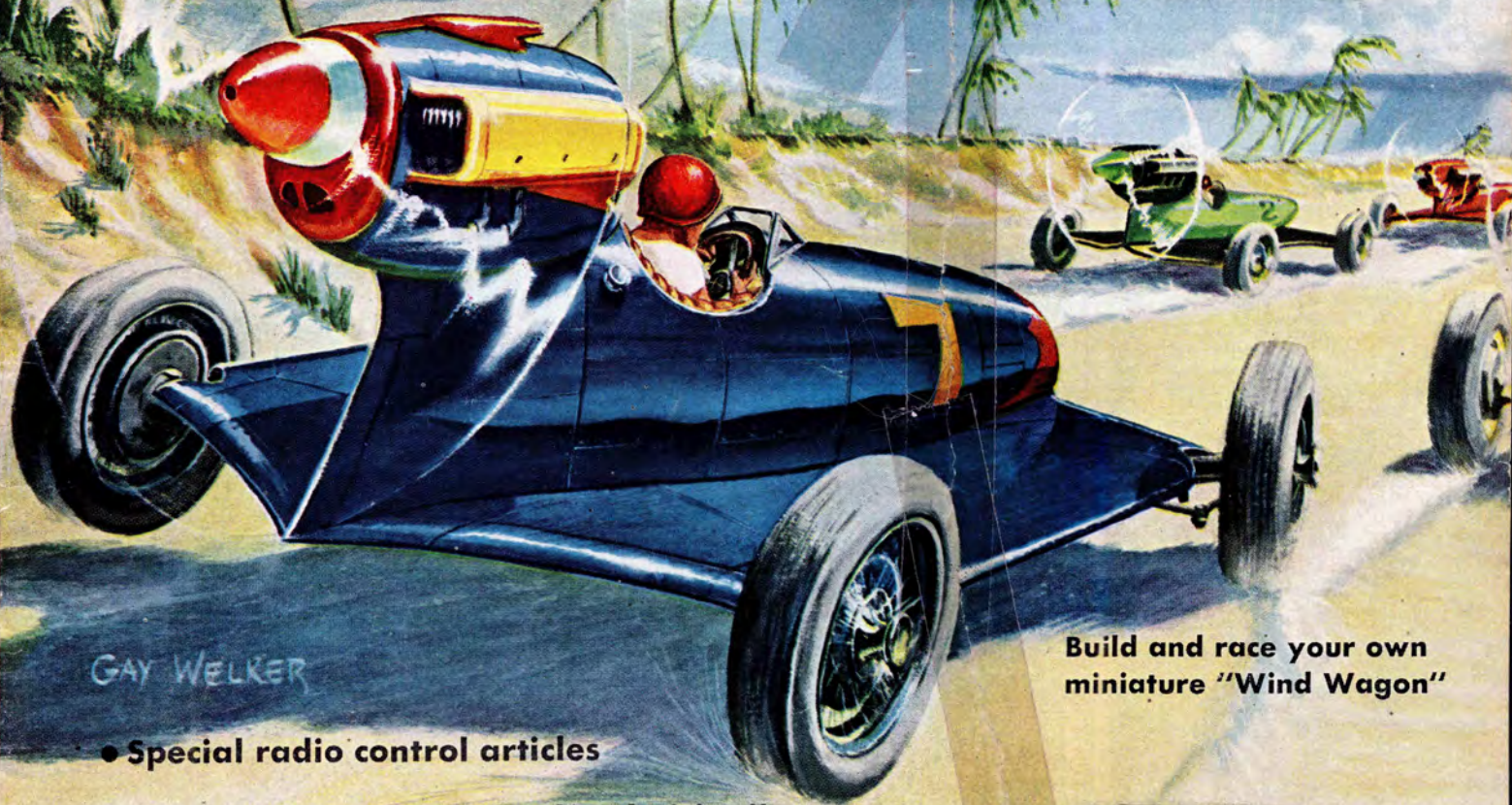
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## AIR TRAILS

## HOBBIES

## FOR YOUNG MEN

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Editorial Offices Located at 304 E. 45th Street, New York 17, N. Y.



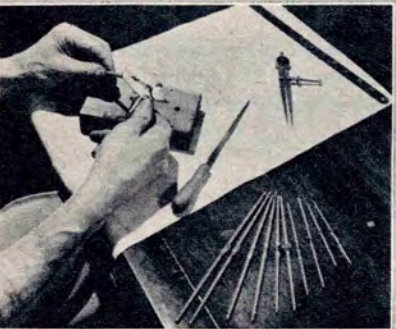
You mean to sit there and tell us that you've never seen a race car like this? We confess we hadn't either until modeler Roy Clough submitted his little Wind Wagon (pg. 38) speed car. The drawing is by Gaylord Welker of South Orange, N. J.



C. Brumbelee & Dad drove more'n 3,000 mi. to a meet: pg. 19.



What kind of monster is this? If you know, identify others, pg. 26.



What goes on? Check your answer with the old salt on pg. 28.



Ready to go to the races? Here's easily-built race car. See pg. 38.

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Air Trails HOBBIES For Young Men published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada. Copyright 1954 by Street & Smith Publications, Inc., in the United States and countries signatory to the Berne Convention and Pan American Convention. 35c per copy. This issue is Vol. XLIII, No. 1. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.



# NEWS F-L-A-S-H-E-S

direct from the 1954 NATIONALS . . .

**MORE NATIONALS CHAMPS WON  
with TOP FLITES and POWER PROPS  
THAN THE 4 OTHER MAKES COMBINED!**

**HERE'S WHAT THE CHAMPS USED TO WIN!**



Here's a real flyer—BOB CHERNY of Sacramento won 2 BIG FIRSTS. Above, Bob shows his Cl. B Senior winning WHOZET, powered by a K & B 23. . . time 16:36.8 . . . fuel, Ohlsson Gold Seal 1/2 A. PROP . . . 9-4 TOP FLITE! See his other 1st below.



Young ROD PHARIS really showed 'em a beauty with his original JUPITER. Bagging 346.5 pts. in Junior Stunt, he fueled his Fox 35 with Power Mist and swung a 10-5 TOP FLITE PROP. Detroit and TOP FLITE are mighty proud of Rod.



Happily winning the helicopter event for the 2nd straight year is "PAR" SCHOENKY of Kirkwood, Missouri. Cheminol AA was the bang-water for his Atwood .049 and O. K. 14 engines . . . and he really got nifty lifts with his 6-3 and 9-4 TOP FLITE PROPS. That's Carl Goldberg of TOP FLITE on the left.



Detroit comes thru again with ED STOLL, who repeated his 1953 win in Cl. 1/2 A Scale Open. This year, Ed amassed 344.5 pts. with his beautiful flying Fairchild. His engine was a Wasp . . . fuel, Cheminol AA . . . PROP, 6-3 TOP FLITE.

## SPECIAL FLASH!

International FAI Gas Winner and  
World Champion Uses Top Flite Prop!

Here he is—CARL R. WHEELLEY of Washington, D. C. In the world's most grueling gas model competition, held on Long Island, July, 1954, Carl beat the best from many nations with his Senator, smashing home with 844 sec. Engine, Torp 15.

Fuel, K & B 1000. PROP—and we're really proud of this one—an 8-3 1/2 TOP FLITE!

### FREE FLIGHT GAS

Cl. 1/2 A Junior  
Darryl Katz  
Detroit, Mich.  
Time 15:14  
Engine Atwood .049  
PROP 6-3 POWER PROP  
Fuel Thimble Drome Racing  
Plane Fubar 36  
Cl. 1/2 A Open  
Gabriel Martinez  
New Orleans, La.  
Time 17:43.3  
Engine Atwood .049  
PROP 5 1/4-4 POWER PROP  
Fuel O & R #2  
Plane Modified Kiwi  
Cl. 1/2 A Scale Junior  
Jim Watson  
Fort Des Moines, Iowa  
Engine Wasp  
PROP 6-3 TOP FLITE  
Fuel Thimble Drome  
Plane F. W. Stosser  
Cl. 1/2 A Scale Senior  
Paul Crowley  
Detroit, Michigan  
354 pts.  
Engine Wasp  
PROP 6-3 TOP FLITE  
Fuel O & R AA  
Plane Aeronca

Cl. A Senior  
Robert Gelvin  
Topeka, Kansas  
Engine K & B Torp 19  
PROP 10-3-1/2 TOP FLITE  
Fuel K & B 1000  
Plane Spacer

Cl. B Junior  
David Brownlee  
Stone Mountain, Ga.  
Time 10:31  
Engine K & B 23  
PROP 9-4 TOP FLITE  
Fuel Home Brew  
Plane Spacer

Cl. B Open  
Earl Anderson  
South Bend, Ind.  
Time 17:52.2  
Engine O & R 23  
PROP 9-6 TOP FLITE  
Fuel Nitro-X  
Plane Gaffy 1

Cl. C Senior  
Don Helfers  
Arlington Heights, Ill.  
Time 16:54  
Engine Torp 32  
PROP 10-6 TOP FLITE  
Fuel O & R AA

Row Senior  
Robert Cherny  
Sacramento, Calif.  
Time 13:33  
Engine K & B 15  
PROP 8-4 TOP FLITE  
Fuel Ohlsson Gold Seal 1/2 A  
Plane Lancer

Row Open  
Sherman Hackenberg  
El Paso, Texas  
Time 16:50  
Engine K & B 15  
PROP 8-3-1/2 TOP FLITE  
Fuel K & B 1000  
Plane Original—My Sin

### CONTROL LINE

Stunt Open  
Don Still  
Beaumont, Texas  
349.8 pts.  
Engine Fox 29  
PROP 9-6 TOP FLITE  
Fuel O & R Hellzfyre  
Plane Stuka

Combat Junior  
Bill Trevisan  
Detroit, Michigan  
540 pts.  
Engine Fox 35  
PROP 10-6 POWER PROP  
Fuel Power Mist  
Plane Original

Combat Open  
Frank Adams  
New Albany, Ind.  
Engine K & B 35  
PROP 10-6 POWER PROP  
Fuel K & B 1000

Flying Scale Junior  
Jose Pinero  
Hato Rey, Puerto Rico  
183 pts.  
Engine Cameron 19  
PROP 8-6 POWER PROP  
Fuel K & B 1000  
Plane Cessna Bird Dog

Flying Scale Senior  
J. McCroskey  
Iredell, Texas  
311 pts.  
Engine K & B 32  
PROP 9-6 TOP FLITE  
Fuel Power Mist  
Plane F-51

Flying Scale Open  
Robert Yeomans  
West Haven, Conn.  
329 pts.  
Engine Two K & B 29's  
PROP 9-6 POWER PROP  
Fuel Hellzfyre  
Plane P2V2 Neptune

Speed Class 1/2 A Junior  
Martin MacLag, Jr.  
Matawan, N. J.  
Time 72.43 MPH  
Engine Thermal Hopper  
PROP 4-1/2-7 POWER PROP  
Fuel Hellzfyre

U. S. Navy Carrier Senior  
Dave Domizi  
Rocky River, Ohio  
417 pts.  
Engine Fox 35  
PROP 9-7 TOP FLITE  
Fuel Cheminol XL-2  
Plane Grumman  
AF2-S Guardian



In 1952, ALEX SCHNEIDER of San Francisco won Radio Control with his S-Channel Rockwood Set and original Piper Cub. This year Alex dominated the field again with 183 pts. Engine, Spitfire 60. Fuel, gas and oil. PROP, 14-6 TOP FLITE.

### PAA LOAD

Cl. 1/2 A Jr.-Sr.  
Joe E. Ziomek  
Allen Park, Mich.  
Time 13:25  
Engine Space Bug  
PROP 6-3 TOP FLITE  
Fuel Nitro-X  
Plane Original

Cl. 1/2 A Open  
Joseph Ziomek  
Allen Park, Mich.  
Time 14:55.2  
Engine Space Bug  
PROP 6-3 TOP FLITE  
Fuel Nitro-X  
Plane Original

Cl. AB Open  
Bruno Marklewicz  
Detroit, Mich.  
Time 13:58.4  
Engine Torp 19  
PROP 9-4 TOP FLITE  
Fuel Nitro-X

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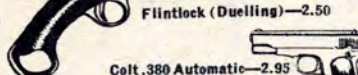
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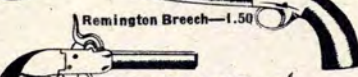
Colt .380 Automatic—2.95



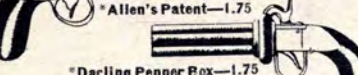
Colt .44 Dragon, 3RD—2.50



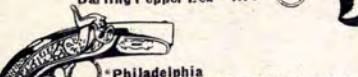
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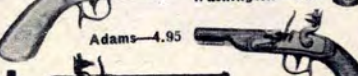
Jefferson—5.95



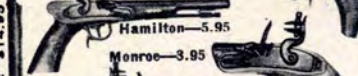
Jackson—4.95



Lafayette—5.95



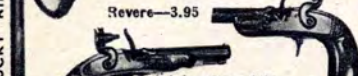
Washington—5.95



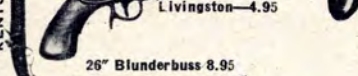
Adams—4.95



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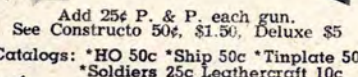
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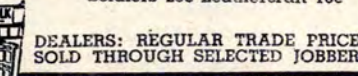
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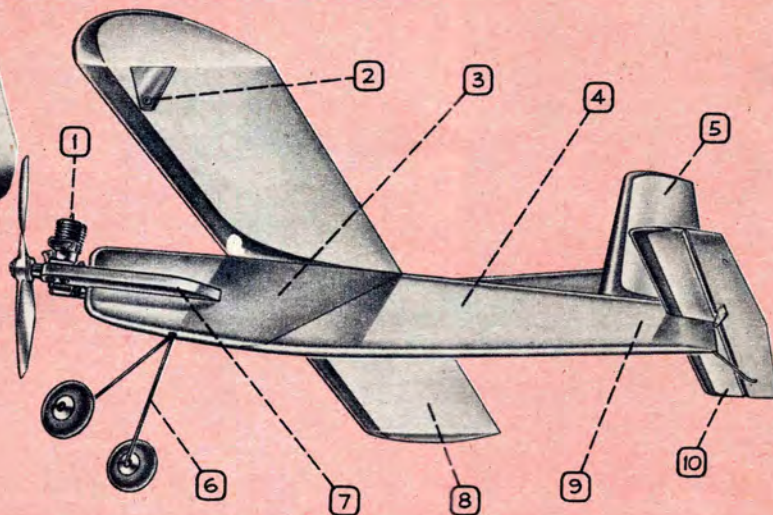
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## ABC Trainer

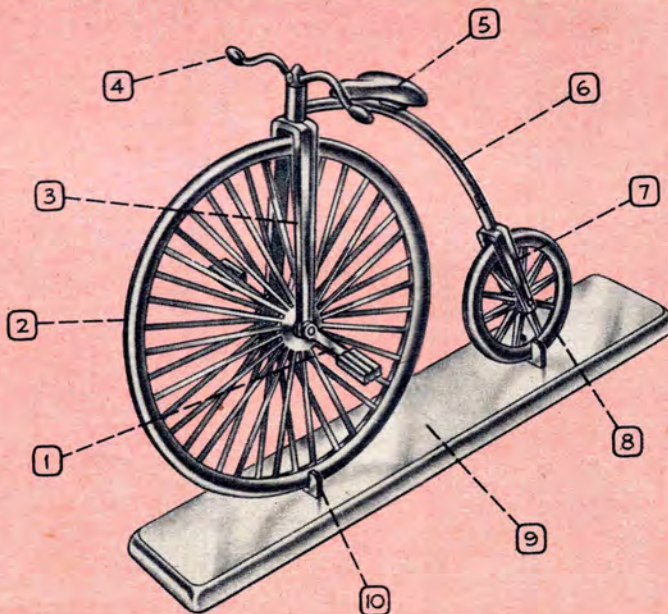


Remarkable Monoline prefabbed kit has one-piece wing fully shaped and hinges already affixed to elevator! Of interest are: 1) Class A, B or C engines suitable; 2) plywood line guide (for "Monoline" control system); 3) shaped hardwood nose section with deep "V" joint ready cut; 4) balsa rear profile section with male joint ready cut; 5) balsa rudder and dorsal fin cut to outline; 6) shaped 1/8" steel wire gear; 7) finished hardwood motor mount; 8) finished balsa wing, drilled for fittings, ready for sanding; 9) offset rudder groove and stabilizer slot cut in fuselage; 10) balsa stabilizer and rudder cut to outline with fabric hinge installed.

This "prefabricated" assembly kit of a bicycle, the Old High Wheeler by Enterprise Model Aircraft Co., Mineola, N. Y., is a real "first" in plastic models. Wheels, molded in two halves, are easily joined. Noteworthy: 1) Separately formed polystyrene pedal arms and pedals; 2) wheels molded in halves, joined by polystyrene cement; 3) complete front fork assembly; 4) handle bars; 5) seat molded separately; 6) rear frame member; 7) rear fork assembly; 8) small rear wheel molded in halves; 9) Polystyrene display pedestal; 10) wheel chocks provided. (Companion model, Kit B-2, is "Tandem" bicycle.)

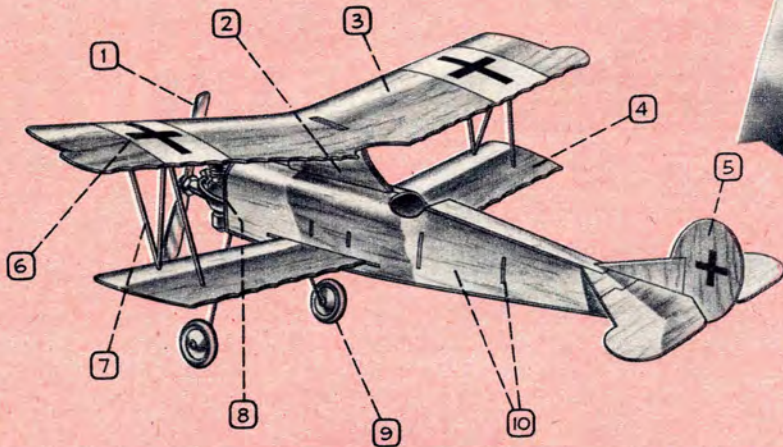


## High Wheeler





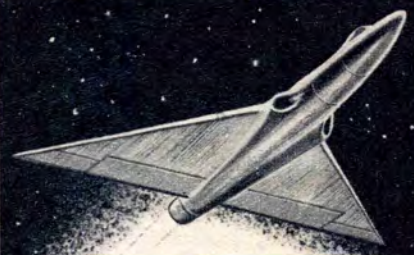
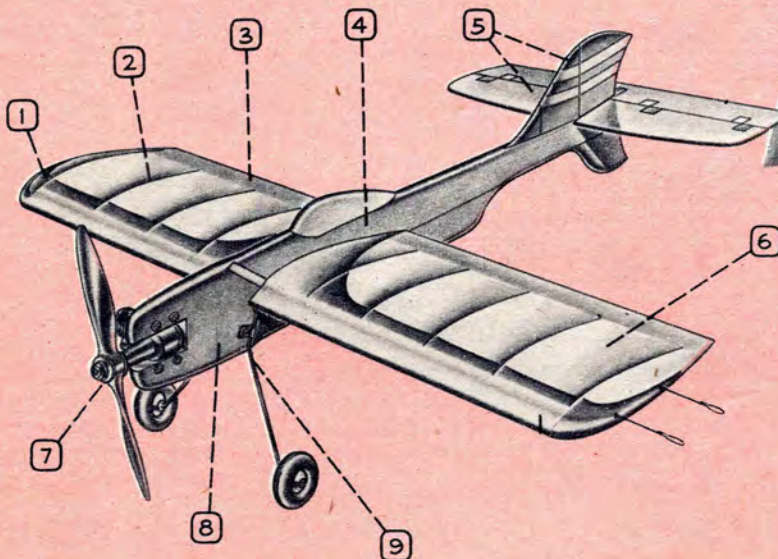
## Fokker D-VII



One of a new fleet of model planes by Springfield Models, Springfield, Pa., this World War I Fokker is a light Half-A free flight for the smaller motors. Items: 1) .02-.035 engines recommended; 2) die-cut balsa two-ply cabane pylon; 3) die-cut, cambered balsa wing with formed dihedral angle; 4) die-cut, cambered, one-piece balsa lower wing; 5) complete die-cut balsa tail group; 6) German decal insignia included; 7) hardwood dowels for wing struts included; 8) die-cut two ply hardwood engine mount; 9) formed steel wire landing gear, finished wood wheels; 10) die-cut balsa formers, fuselage sides, top and bottom.

Produced by P.D.Q. Products Co., Millville, N. J., the Circus Prince is a profile fuselage stunt model which has already made a place for itself in Southern combat circles. Wing span is 27 inches. Features include: 1) Balsa wing tips cut to outline shape; 2) die-cut balsa wing ribs; 3) tapered, notched trailing edges; 4) ready-cut balsa parts for profile fuselage; 5) balsa tail parts cut to outline; 6) Silkspan wing covering material included; 7) .14-.29 engines recommended; 8) die-cut plywood fuselage doublers; 9) formed steel wire landing gear; 10) shaped balsa leading edge, notched for ribs.

## Circus Prince



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- Louis A. Vaughn of Vancouver, Wash. Engineer, Lockheed Aircraft Corp., Burbank, Calif.
- Bernard W. Bower of Long Beach, Calif. Aerodynamicist, North American Aviation, Downey, Calif.
- George E. Anderson of Lynwood, Calif. Engineer, Northrop Aircraft, Inc.
- William F. Krause of St. Charles, Mich. Aircraft and Engine Mechanic American Airlines, Inc., Los Angeles, Calif.
- Francis L. Clabaugh of Altoona, Pa. Engineer, Guided Missile Division, Consolidated Vultee Aircraft Corp., Pomona, Calif.
- Peter G. Senchuk of Youngsville, Pa. Liaison Engineer, Douglas Aircraft Co., Torrance, Calif.
- Cyril R. Cacace of Cairo, Egypt Aircraft & Engine Mechanic, Los Angeles Air Service, Hawthorne, Calif.
- and many, many more.

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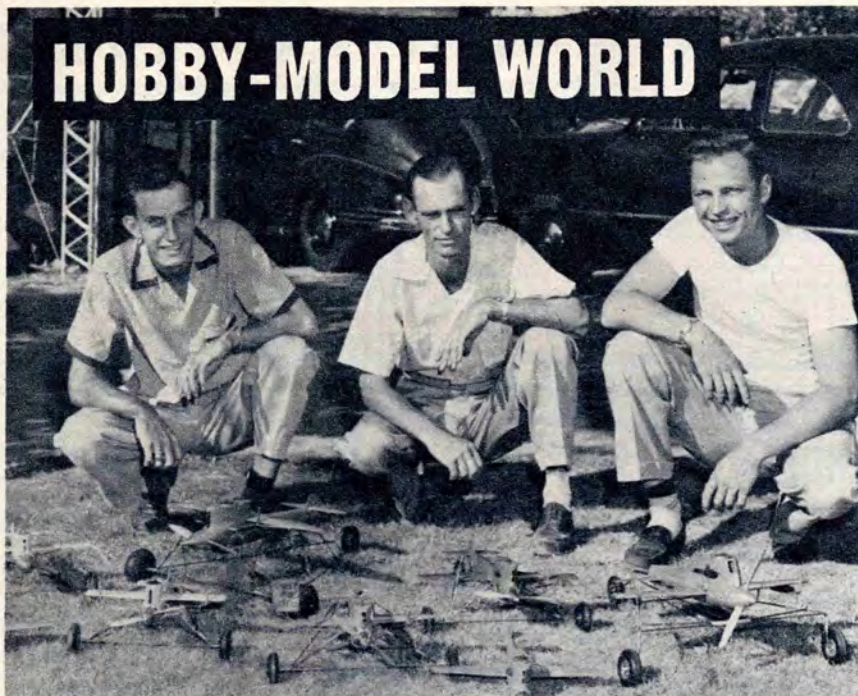








# HOBBY-MODEL WORLD



Jack Stuart, Charles Bowman and Dick Koshy, all from El Paso, Texas, with line-up of fast-moving control line planes. Trio has made name for itself in Western speed circles.

■ America retained the world's model power plane F.A.I. championship crown by the victory of Carl R. Wheeley of Washington, D. C. at the "World Model Air Olympics" at Westhampton, Long Island late in July. The U.S. team also won the group award in the free flight gas event. But the Wakefield Cup went to Australia through the magnificent performance of Alan King of Victoria who made five perfect three-minute flights with his Wakefield models. However, the American team walked off with top group points in the rubber-power event.

Individual top high times (in total number of seconds) for the F.A.I. gas championship were as follows: Wheeley, 844; Silvio Lanfranchi, Switzerland, 831; David Kneeland, 1953 winner and defending champ, Hickman Mills, Mo., 783. Team standings (total time of all members) were: U.S.A., 2,204; Argentina, 1,826; Canada, 1,712; Great Britain, 1,533; Switzerland, 831; Australia, 650; Sweden, 601; and Guatemala, 404.

In the Lord Wakefield rubber powered event top places were: King, 900; Charles B. Jackson, England, 866 (proxy flown); Allan K. Lim Joon, Australia, 864 (proxy flown); John H. Upson,

England, 844 (proxy flown); and Robert Dunham, Tulsa, Okla., 835. Team standings were as follows: U.S.A., 2,404; Great Britain, 2,334; Canada, 2,332.

Fifty-two contestants, representing 14 nations in person or by proxy, competed in the two-event "Internationals" which were held under the sponsorship of the Convair (Consolidated Vultee) Division of General Dynamics Corp. Lt. Gen. James H. (Jimmy) Doolittle served as Air Marshal for the affair which was run off at the Suffolk County Air Force Base.

Mr. Wheeley, the technical director of the Academy of Model Aeronautics, also flew last year in England in the F.A.I. free flight gas event as a member of the American team. His designs for free flight models, "The Senator" and "Little Senator," have appeared in this publication. Mr. King had the misfortune to lose his best model on his 4th flight in the Wakefield event, but still racked up a perfect 3-minute duration with a spare airplane.

Weather was close to ideal for both the power and rubber event except for a brief period of rain around noon on the second day of the meet; after a luncheon shut-down the skies cleared and the (Continued on page 78)



Campfire scene at California meet: Stan Hill fries the potatoes ably assisted by Santa Barbara club members (steaks followed). Below is 10 lb. thrust rocket-powered Saunders-Roe model used in flight tests.



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Warhawk P-40F G-15  
Panther Jet F9F G-16  
Thunderbolt P-47 G-17

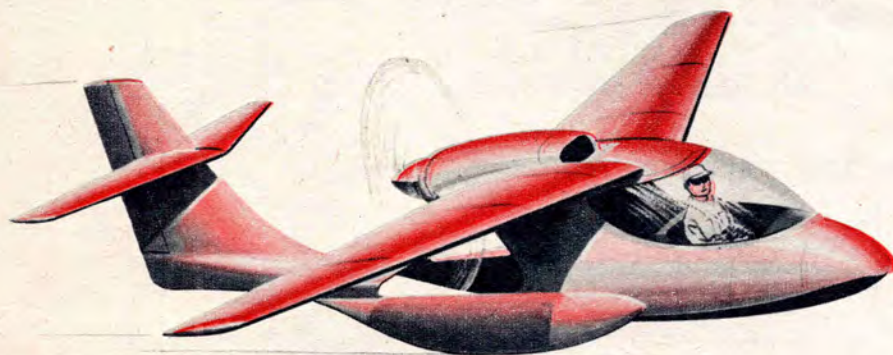
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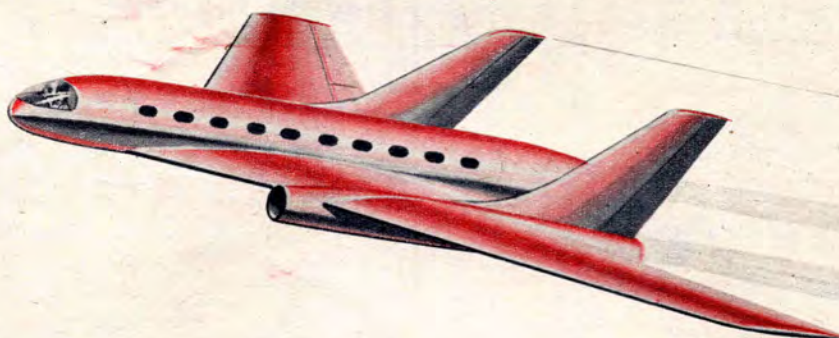


Three-place amphibian powered by a turboprop engine from the drawing board of Richard Locher of Chicago, Ill. Fuel is carried in the pontoon-like sponsons on each side of the hull which also house the main landing gear; nose wheel retracts into the lower part of the bow. Interesting part of the design is the thrust angle change feature of the engine. The entire nacelle can be tilted downward, thus giving upthrust to the powerplant to facilitate take-off. Span 35 ft.

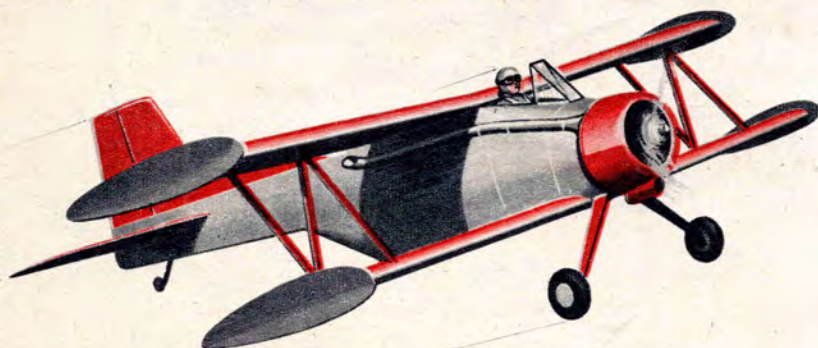
**SECOND**  
**\$25** Four-jet Airliner  
**AWARD**



Design for a modern transport powered by four 5000 lb. thrust jet engines paired in two nacelles, by Lynelle Tate of Cedartown, Ga. The airplane seats 40 passengers in a pressurized cabin and carries a crew of four. Sharply sweptback wings have elevators on the inboard section of trailing edge. Wingspan is 65 ft., overall length 60 ft., maximum speed around 700 mph. Tail chute reduces landing run.



**THIRD**  
**\$10** Agricultural Airplane  
**AWARD**



Negative stagger agricultural airplane by Robert A. Walls of Dallas, Tex. Prime requisite for a duster and sprayer is ability to carry a heavy load and be capable of slow flight. This is achieved here by large wing area, reverse stagger and tip plates, all of which contribute to high lift and low stalling speed. In addition, negative stagger permits placing pilot way up front where his visibility is good. Plane can be loaded through the rear cargo door. 220 hp engine.

**AIRMEN OF VISION DESIGN COMPETITION**

Rules governing this competition are as follows: Three-view sketches of envisioned aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of complete airplane or space craft in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on powerplant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant

will be welcomed. The design may be of any type; space craft, commercial, military planes (fighters, bombers, troop transports), planes for private flyer and sporting or racing airplanes. Entry each month judged most practical or of greatest significance will receive \$50; \$25 for second place and \$10 for third. Mail entries to Airmen of Vision, c/o Air Trails HOBBIES for Young Men, 304 E. 45th St., New York 17, N. Y. The editors regret they cannot enter into any correspondence on submissions.



## THE WINNER!

Bob Moncrief, of Torrance, California, sets New National Record of 32½ ounces! Credits **Thimble-Drome** with Winning Performance. His only comment: "How could I miss?—with 600 square inches of wing area teamed up with **Thimble-Drome** Thermal Hopper Engine and Racing Fuels!"

At the Vessels Ranch, Long Beach "Thunderbugs"—sponsored Clipper Cargo meet, Bob Moncrief's **Thimble - Drome**-powered, fueled, & "wheeled" cargo job topped the high mark of 23¼ ounces, set in 1953, by 9¼ ounces! His prize-winning plane weighs 10 ounces—plus payload, his record means a total airborne weight of 42½ ounces! Bob's beautiful plane took off and landed on the macadam runway without damage to its TD doughnut-type wheels, which weigh only 1/27th ounces each!

\* TD Doughnut type wheels are plastic, with metal bushings. Weight: only 1/27 oz. Diameter: 1-1/8th". 30c each.

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See complete  
details next  
month's issue



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# AQUA-tivities



■ Little "tricks of the hobby" certainly make for better building, and are the things that you learn as you gain experience. You also learn some of the things that you *can't* do; ever stop to think of the myriad pitfalls facing a complete newcomer to boat-building, or any other hobby that involves construction? Friend of ours recently took the plunge into hobby work with a small boat kit from a reputable maker (Sterling). These kits are noted for the completeness of the building information, but it was astounding what questions our friend had to ask. And the troubles she got into! (Yep, 'twas a lady.)

For example, when after the first coat of clear dope on the well-sealed and smoothly sanded mahogany deck this lady—who has done lots of painting around the house—tried to brush out rough spots in the dope, as she had been so used to doing with ordinary oil paint. The result was disaster, of course, so the whole surface had to be refinished. Another time she was searching for a little bottle to hold dope thinner, for cleaning brushes. One of these plastic jobs that are used so widely today for holding pills looked just right, and after the brush was cleaned, was left quarter filled with thin-

ner. You guessed it—when she came back to the job several hours later, the plastic bottle had dissolved into a sticky mass, and the thinner had soaked through a thick layer of newspapers and taken off a good sized patch of paint on the table top beneath!

Wonder why some dope maker doesn't come out with this material in mahogany color, for use over balsa? We've mixed up our own brews for this purpose, but the results are not too satisfactory, and you can never repeat the tone, if you want to mix more. Red dope with a dash or two of black does fairly well, but if you don't mix just right, you'll end up with a chocolate-colored boat.

Mahogany veneer and ply is furnished widely in boat kits, and if finished correctly, it does come out a beautiful rich color. Some builders give it the full treatment, with mahogany filler, stain, etc., while others prefer simply to use balsa sanding sealer, followed by clear dope. If you want to use the stain procedure, there are a couple of precautions to observe; firstly, don't let any cement get on the mahogany surface while the boat is under construction—the stain won't "take" under the cement, and you'll have a splotchy appearance. And second—don't get the stain on any surfaces that will later be finished in light colors, for the stain will "bleed" through, and your light finish will be spoiled. Yep, live and learn!

Wonder why more boat builders don't use reduction gears for the prop drive, when using electric power? Such an arrangement is more trouble to set up than direct drive, but the results are certainly worth it. Electric motors draw least power when running without load, the current going up and up as the motor is slowed down with increasing load. So a



Tremendous radio control cabin cruiser model by Jack Firestone weighs 60 pounds, uses Wall 4-cycle engine for power, Rockwood radio receiver. In action at top.



direct-drive motor will be slowed down lots more, with a given prop, than one that is geared. Perhaps some of our readers have made tests to see what the prop speed and current drain might be when the same prop was run direct, and geared down two or three to one.

A tiny boat ("Economo") was built recently to see what could be done in the way of really long battery life, using the fantastically economical toy auto motor described in some detail in the Sept R/C Column. A 13-inch of the runabout style, she was built from sheet balsa, and fitted with a Sterling 1" nylon prop and a four-to-one reduction gearing. Now this boat won't take any speed records, but it will furnish hours and hours of pleasure on a single set of pencils; current drain is only *thirty milliamperes* when the motor is run on four pencils connected in series to give 6V.

**News from the Builders.** R. L. Brown (129 N. Oak St., Chino, Calif.) says he threw out a bunch of old papers recently, and unfortunately included some unanswered letters from modelers around the country. He has asked us to request that if any of these fellows do not get an answer to their letter—write Brownie again, and he'll make sure they are taken care of.

From Minneapolis, Red Costlow (1709 Lagoon Ave.) writes that a real honey of a Sterling Sea Maid has been built by Dick Flinchbaugh; fitted with K&O motor, lots of lights, and has ED Boomerang R/C equipment with ED clock-work escapement for steering. Mort Walters has a Sea Scooter powered by Cub .09, which he uses for an R/C equipment test bed—perfect for this purpose, and gives him a lot of kicks besides.

Regular bulletins reach us from Bill Baughman (3432 W. 43 St., Los Angeles 8, Calif.) on doings at the S.C.M.P.B.Y.A. Some problems have arisen regarding parking at their boating site—Alondra Park; meetings with the County officials are being held to iron this out. New Chairman for the Radio Control and Steering Race Committee has been appointed—Chet Anderson. The club has discussed a set of rules suggested by the Detroit Model Power Boat Club, to cover racing with Half-A outboard engines; the rules seem good to the L.A. boys, in general, but they have a few different ideas that are being considered by the Tether Race Committee.

So that other model boat groups may see what the very active Detroit club has worked out in this connection, we give a few of the most important rules here. Hull shall be of a type that resembles full-sized racing outboard boats—no restrictions on length, beam or weight. There are two age groups—Senior Class, over 16 years, Junior—10 years of age but not over 16. Junior Class engines must be strictly stock, except for props. Senior engines may be reworked, but must not be over .055 cu. in. displacement. Course shall be 52'6" in diameter. Bridle must be not less than 2' long from center of hull to hook-up ring on running line; minimum line size is .008 stranded control cable. Pole pivot height not more than 2' above water. A heat shall consist of four laps (1/8 mile), and three heats make a race. (Continued on page 69)

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|                            | F-82 Twin Mustang ..\$3.50 |                          |

### JET MODELS

|                            |                         |                    |
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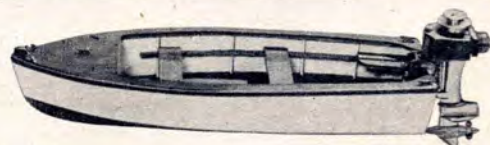
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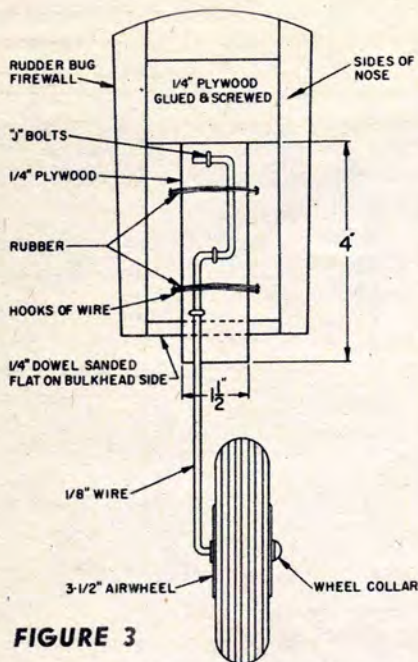


FIGURE 3

the right values, since the leak in such circuits is often rather high in value. Ralph finds that proper adjustment of the grid leak results in slightly greater plate current dip, but the real dividend comes from better overall control of the receiver.

**News Items.** The Flying Bisons club (Buffalo, N. Y. area) had expected to hold an R/C free-for-all over the July 4th weekend and sent out a questionnaire to those they thought might be interested in coming. However, this was done a little too late, as they found that many R/Cers had made previous arrangements for the holiday. The club, therefore, has decided to concentrate on holding such a gathering over the same holiday in 1955—so mark this down.

Many flyers sent their regrets, but indicated they would love to attend at a later date, and it is expected that this will be an annual affair; the Bisons have an outstanding flying field, located on Millersport Highway (Route 263 and New Road, 7 miles north of Sheridan

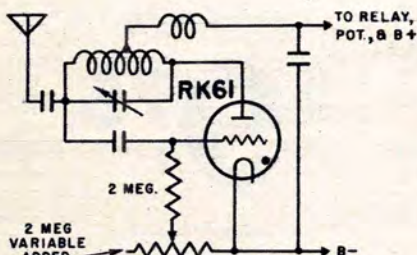


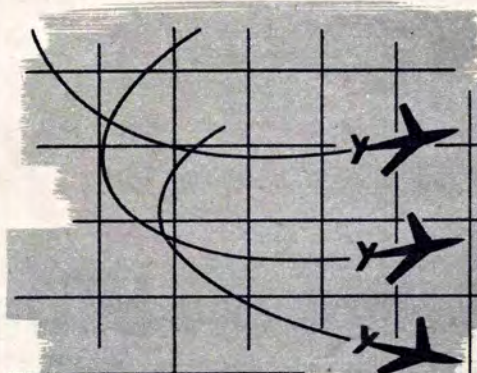
FIGURE 4

Drive, Route 324); the meeting will be of the informal type, with movies and bull sessions in the evening, and fun-flying all day. Everyone who can attend is invited, so plan now for '55; full data from Sec. Howard Thomas (39 Lorfield Dr., Snyder, N. Y.).

Seems that the Larks (Los Angeles Radio Controllers) did very well in the R/C event at the Pacific Championships. In the Multi-Channel event—defined by number of (Continued on page 83)

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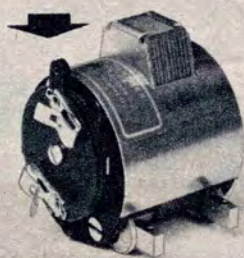
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# Speaking of HOBBIES

A new type of modelplane contest has passed into the record books and Jim Walker has logged another "first" in modeling history, setting an example he hopes other manufacturers or model industry members will follow. The photos show in order: a portion of the contest site at Ft. Lewis with Mt. Rainier in the background; Donald Kerzie of Seattle with his Half-A powered free flight scale winning model plane; and Gilbert Coughlin of Tacoma being congratulated by Mr. Walker. Gil won the meet's TRIP AROUND THE WORLD!

The Jim Walker Model Airplane Meet (1954 Northwest Championships), entirely sponsored by him at Fort Lewis, Washington, was designed for the model builders' pleasure. The entire three-day meet, with the theme of Fly, Fly, Fly, Have Fun, Have Fun, Have Fun, had the tranquil appearance of a Sunday afternoon flying session in a park, with everyone thoroughly enjoying himself. There were no harried looking model builders standing in processing lines or dashing around trying to get in their flights before deadlines.

Contestants flocked to the contest from all parts of the country, almost doubling the number ever before registered in any model meet in the Northwest area. Charles Brumbelee of Augusta, Georgia, drove something over 3,000 miles to take first in the Junior-Senior "C" Speed Event. Flying time was triple the usual amount available, and the contestants chose the time and day that suited their convenience. Even Mother Nature smiled on the contest with three beautiful days of sunshine.

One novelty contributing to the contest's tremendous popularity was a restaurant set up on the flying field, and open to everyone. The contestants were able to buy their food at cost. A T-bone steak, hash brown, and salad cost contestants only \$1.11. Ham and eggs, hot cakes, etc. were served hot off the grill from 6:30 in the morning and a complete variety of food, including milkshakes, pie ala mode, and deep fried chicken were available all day long. Event directors who were snowed under had hot meals served in the field, direct from the kitchen.

A second feature receiving acclaim was a large score board showing the up-to-the minute standings of the first ten places in all events. An elaborate telephone and switchboard circuit kept the score board posted and the public address system kept the contestants informed of the scores as soon as they came in. Flying time was unlimited and although official flights for the most part were from eight in the morning until seven or eight in the evenings, by prior request, officials were available daylight or dark to score flights. Processing and recording were conducted in each event area for the convenience of contestants, who were allowed to drive cars to the site, making the burdensome lugging of planes and equipment around the field on foot unnecessary. To top it all off, a King-sized aerial fireworks display was put on by Mr. Walker. ("Shucks," one contestant was heard to say, "why bother about going around the world when you got all this here—fancy eats, no lines, and now all them purty lights popping out!") A new event, called Helicopter Combat, was introduced at the Meet and topped the U-control events in popularity. It amounted to trap shooting with U-control models. The object of the event was to break Ceiling Walkers launched by the contestant's helper, hitting them with a control line model. Each contestant was allowed twenty Ceiling Walkers in two flights and scored 1 point for a hit, and 5 for a break. Event was won by William Shrader with (Continued on page 60)



## STREET & SMITH PUBLICATIONS, INC.

Our 99th Year—Established 1855

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Michael J. Bardon of Yorktown, Va., was nine when he qualified for his Novice license; first station contacted was in Phila.



Another Novice Class licensee, Arnold Greenberg of Whitestone, Long Island, holds call letters KN2ABW. Uses code on 80 meters.

power outfit, to be sure. But don't sneer at low power; signals have been sent and received over thousands of miles with such equipment, and you can have a lot of fun with your simple and inexpensive rig. By far the majority of amateur transmitters are home built. On the other hand, a large percentage of receivers are "boughten." Transmitters can have as few as one or two tubes, and very simple circuitry, but even the simplest receiver has four or five tubes, and some of them have almost as many as a TV receiver. Of course, you can do a faster job of putting together a station if you use commercial kits. We list a few of those to be had; there are many more, and they come in all prices.

Following the last world war, many millions of dollars' worth of radio equipment was put on the surplus market at surprisingly low prices, and the hams had a field day grabbing up the beautifully made stuff. It was soon found, however, that most of it had to be altered to be of real use on the ham bands. Surplus prices have risen a lot in the last few years, and the newcomer to ham radio would be well-advised to steer clear of surplus apparatus, unless he has the technical knowledge to make the necessary conversions.

There are all kinds of commercially manufactured equipment on the market, some of it especially designed for the amateur user, other lines practically the

same as used by government services, airlines, and commercial communications concerns. Prices of some of this gear go up into the thousands, but operation and reliability are top-notch. The usual beginner starts with the low-cost lines or kits, and adds or changes as he feels the need for better equipment. Very good buys in used equipment are to be had from the large ham supply dealers; hams are as fussy as photo fiends, and some of them trade receivers or transmitters every time a new model comes out.

It is estimated that the average ham has an investment of around \$800, which includes not only the actual operating set, but test equipment, tools, spare parts, antennas, etc. Sounds high, but this "average" ham has been accumulating his \$800 worth over a period of years—at a rate of perhaps \$150 annually. Not too much, is it, when you figure how much the photo fan, the stamp collector, the model plane addict, or the hotrod builder spends per year?

Most large groups of hobbyists have an organization devoted to their special needs and interests; in ham radio it is the American Radio Relay League—generally known simply as ARRL.

The League is a national non-profit organization, governed by a board of directors who are elected by the general membership; it was founded in 1914 and has functioned ever since to further the science of ham radio, foster favorable legislation (and to fight that considered to be unfavorable—and there has been plenty of that!), to certify the many rec-

ords set in amateur operation, to consolidate emergency communication arrangements among amateurs, and so on. By far the largest majority of hams belong to the ARRL, and derive constant benefit from its services, which include the monthly publication of the magazine "QST"—which in ham parlance is the "general call to all stations."

The Amateur Radio Emergency Corps consists of hams who maintain equipment in constant readiness to answer calls for help from such agencies as the Army, Navy, Coast Guard, Red Cross, State and Local Police officials. Hams have set up vital communication networks, at times when all other forms of communications have broken down, at virtually every disaster that has occurred in any part of the U.S. You can always find them in operation at the site of floods, hurricanes, explosions, earthquakes and tornadoes.

For those who are interested in learning military procedure and operating, there are the Military Affiliate Radio System and the Naval Electronics Warfare Reserve, which conduct weekly drills on military frequencies. Such training can be invaluable later.

Through the training they have received while building, maintaining and operating their own equipment, radio amateurs are enabled to qualify for good spots in the electronics industry, many of whose leaders today are active hams. This is something like an amateur tennis player or golfer turning pro—but in the radio field, these new pros can still maintain their amateur status too, and pursue their hobby with other amateurs just as long as they wish.



Typical of many of the transmitters available is the Meissner "2-CW" (left); see chart for listing.

#### Classes of Amateur Operator Licenses

| CLASS.      | CODE SPEED | AVAILABLE BY MAIL* | WRITTEN EXAM             | PRIVILEGES                                          | TERM    | RENEWABLE** |
|-------------|------------|--------------------|--------------------------|-----------------------------------------------------|---------|-------------|
| Novice      | 5 wpm      | Yes                | Simple                   | Restricted                                          | 1 year  | No          |
| Technician  | 5 wpm      | Yes                | Moderate—same as General | Any band and type of transmission on 220 mc. and up | 5 years | Yes         |
| General     | 13 wpm     | No                 | Moderate                 | All bands and types of transmission                 | 5 years | Yes         |
| Conditional | 13 wpm     | Yes                | Same as General          | Same as General                                     | 5 years | Yes         |
| Extra       | 20 wpm     | No                 | Complex                  | All                                                 | 5 years | Yes         |

\* Novice and Technician licenses are available only by mail. Conditional license is same as General Class in every way, but is given only by mail to those who reside more than 75 miles from an F.C.C. examination point.

\*\* There are certain requirements you must fill regarding "proof of use," before a license will be renewed.

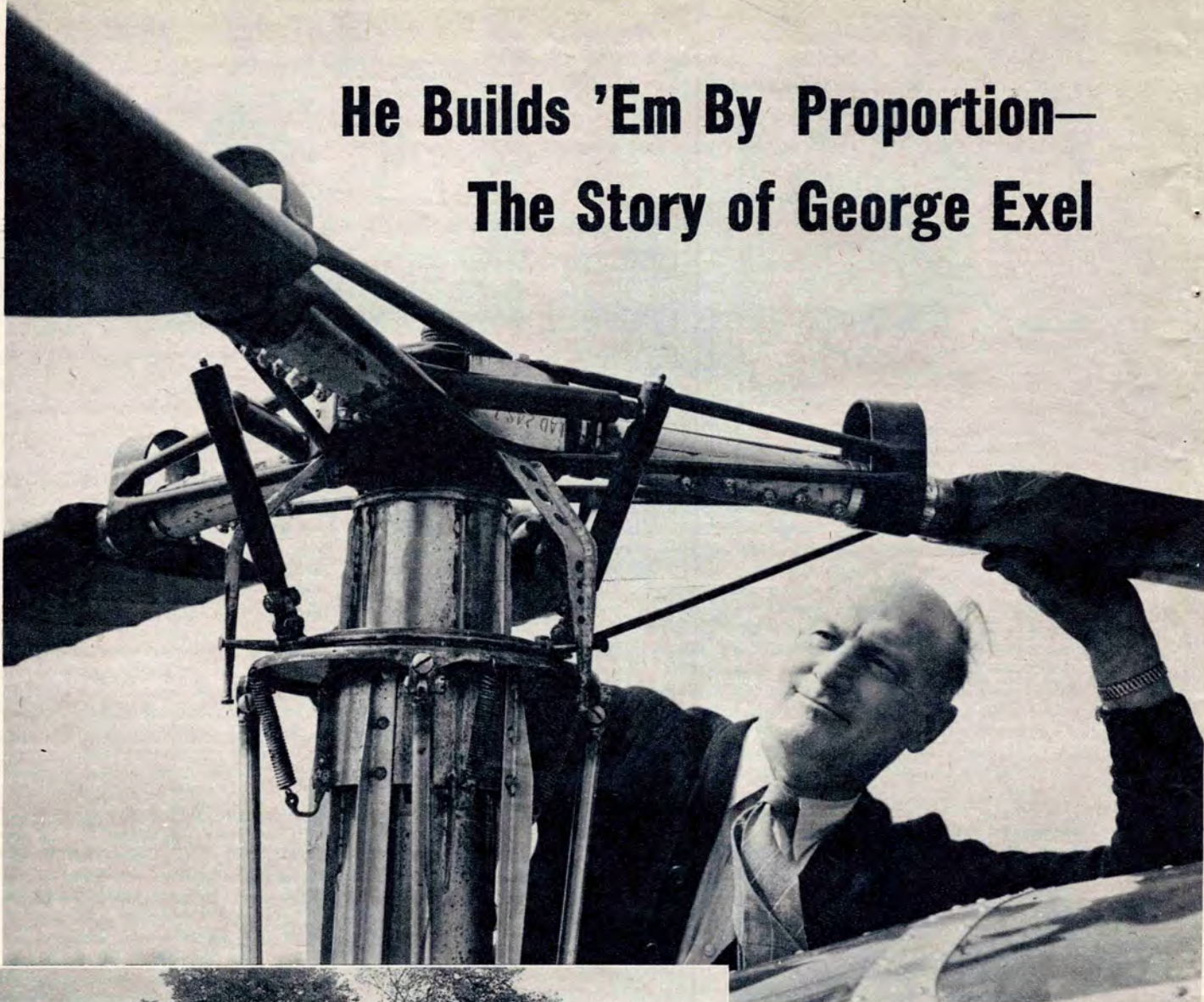
Note that the above table covers only Operator Licenses; every Ham must license his station as well; the Station License carries with it the privilege of using the F.C.C.-assigned call letters. You can have an Operator's license without a Station License, but not vice-versa. We strongly recommend that those interested obtain a copy of "The Radio Amateur's License Manual" (50c from ARRL, West Hartford 7, Conn.)

#### Low Cost Ham Radio Kits

| MAKER       | MODEL NO. | USE    | POWER RATING | NO. TUBES | PRICE   | REMARKS                                                                 |
|-------------|-----------|--------|--------------|-----------|---------|-------------------------------------------------------------------------|
| Meissner    | 2-CW      | Trans. | 20 W.        | 2         | \$24.95 | Built-in power supply. Less tubes and crystal                           |
| Meissner    | T10-1199  | Rec.   |              | 6         | 29.55   | 550-1600 kc. 6-18 mc. Built-in power supply and speaker. Tubes included |
| Meissner    | T3BK      | Rec.   |              | 3         | 12.00   | With tubes, no speaker                                                  |
| Eldico      | TR75-TV   | Trans. | 60 W.        | 3         | 64.95   | With tubes, case, power supply, less crystal                            |
| Philmore    | NT-200    | Trans. | 25 W.        | 3         | 29.40   | Includes power supply and tubes, no crystal                             |
| Philmore    | 7001C     | Rec.   |              | 3         | 11.76   | With speaker and power supply, less tubes                               |
| Heathkit    | AT-1      | Trans. | 35 W.        | 3         | 29.50   | With tubes, meter, case, less crystal. Power supply included            |
| Heathkit    | AR-2      | Rec.   |              | 6         | 25.50   | 535 kc.-35 mc. Built-in power. speaker, tubes included                  |
| Walter Ashe | WAT-25    | Trans. | 25 W.        | 2         | 17.31   | Includes tubes and crystal, no power supply                             |
| Walter Ashe | WAR-25    | Rec.   |              | 1         | 13.41   | With tube, no power supply                                              |
| Walter Ashe | WAP-25    | Power  |              | 2         | 14.23   | With tubes. Power supply for both above units                           |



# He Builds 'Em By Proportion— The Story of George Exel



Exel is not an engineer; he is a practical man endowed with a feel for proportion, a talent to solve complicated problems in a practical way. He built his first plane from scant data.

The tri-axial helicopter built in 1924 had a third rotor in order to equalize downwash velocity along the entire span of blades. Paddles behind wheels were for control purposes.



■ To most anyone else learning to fly a helicopter at the age of 58 would be considered as quite an accomplishment. But to George Exel it was just something he had to do. And what's more the learning was not done in an approved helicopter, designed by aeronautical engineers, built by an established firm, and fully tested before being released to the public. No, Exel's first flight in a helicopter was also that helicopter's first flight. In fact, it was the test flight of the EXEL-i-copter, designed by Exel and built by him in the small shop in the rear of the gas station he operated in New Jersey.

The Exel story begins quite naturally with his birth in Norwich, N. Y., in 1891. Soon after he was born, his folks moved to New Jersey and that state has claimed him as her native son ever since. His formal education carried him through the fourth grade of grammar school. In that era, the horseless carriage was just making its existence known, and Exel lost no time in probing its every part. Soon his natural abilities with tools manifested itself, and he became quite familiar with the intricacies of this new mode of transportation. However, the event that had a profound effect on Exel's future life occurred in





Man-powered, or muscle-powered, airplanes have been the goal of designers for many years. When in 1914 the French government offered a substantial prize for such a project, Exel built a winged bicycle powered by a propeller pedal-driven through chain and sprockets.



1905 when, at a county fair near Pater-son, he watched with the open-mouthed admiration that only a 14-year-old can muster as Charles Hamilton guided his gas bag over the fair grounds. Then and there, Exel decided that he, too, wanted to fly.

By 1912, working from newspaper clippings and magazine articles, Exel built a Bleriot type airplane and fitted it with an engine of his own design and construction. Flights consisted of hedge-hopping in the local area, but they were the start of an ambition to build and fly his own machines that carried him through many trials and tribulations and which finally culminated in his flights in the EXEL-i-copter. This craft also set the pattern of all his subsequent airplanes and helicopters. Never having had a formal engineering education, and working at a time when aeronautics was not established by tried and true formulas, Exel relied on what he calls "Proportional Aeronautics," the belief that if all parts are kept in proper proportion, the craft should fly.

The "good old days" of aviation saw many prizes being offered for all sorts of flights, and the amounts offered were even by today's standards quite fantastic. In 1914, the French Government offered \$10,000 for the first man-powered aircraft to fly a distance of 35 feet. This attractive offer caused Exel to build a bicycle-with-wings with which he hoped to capture the ten thousand ducats. However, the commencement of World

War I caused the French to withdraw their offer, and Exel dropped the project to enter the Army.

After the war, the prize craze began anew, and the British Government in 1921 offered \$250,000 for the first practical helicopter to meet the following requirements: It must fly 60 miles per hour; hover stationary over a given spot for 30 minutes in a 10-20 mile wind; ascend vertically to 2,000 ft.; make a dead-stick landing (now called autorotational landing in helicopter circles) from 500 feet in a 100 foot radius; and carry enough fuel for one hour of flight plus a 150-pound military load.

This was an ambitious undertaking for 1921, but it was enough to prompt Exel into making his first helicopter. A 20 horsepower Buick automobile engine was used in a co-axial design. The Buick proved to be woefully overburdened so Exel bought a war-surplus Gnome rotary engine which gave him 115 hp. To the Gnome he attached a four-bladed rotor, and to the shaft of the engine he attached a hand-carved wood propeller. The torque set up by the wood propeller made the main rotors turn in the opposite direction, giving him lift and at the same time offsetting the torque.

Tests of the craft on the frozen Passaic River showed that while the rotors created sufficient lift, Exel's control system was inadequate. Exel then installed a transmission between the engine and the main rotor, and mounted a third rotor on the craft making it a tri-axial.

In 1926 a windstorm wrecked the tri-axial before Exel could test it thoroughly. His attempts are not to be ridiculed, because the foremost designers, engineers, and aeronautical experts of the time were all engaged in similar attempts, and after all the machines entered in the contest were tested at Farnborough, England, in 1925, it was found that none could meet the stiff requirements.

Undaunted, Exel continued. By 1934 he had completed a more modern looking co-axial job. Still using the Gnome, Exel attached another four-bladed main rotor of much smaller proportions than any of the previous ones. The same wood propeller was used. Tests of this craft showed that the old Gnome just was not enough for the job. Through the use of full cyclic and collective pitch control of his rotors, Exel was able to achieve almost satisfactory control of his machine. Up to this point he had been able to get lift in one machine and control in another; now to put them both together for a successful helicopter was the problem facing him.

Like most of us, Exel found money hard to get. He had to work at whatever he could to finance his experiments—because of an independent streak he refused to have any outside help. The second World War found him engaged in essential industry. Of course, the helicopter had to take a back seat to all else, especially since the materials he required were almost impossible to obtain. However, (*Continued on page 77*)



The designer flying his latest helicopter, Model 100. Blades are from surplus Platt-Le Page, other components from dozen automobiles.



Number 5 helicopter, built in 1934, still sported the old Gnome rotary. However, Exel had already equipped it with cyclic pitch control.



First attempt was this coaxial helicopter, insufficiently powered by an auto engine.



In 1923 he used active and reactive elements of engine to compensate for rotor torque.



Machine built in 1925 was more successful; it could rise a few inches off the ground.





This microscopic model of French dueling pistol used in 1845 is not a toy but a real gun capable of firing tiny bullets. Complete set consists of two pistols, powder flask, bullet moulder.

# Pint Sized Arsenal

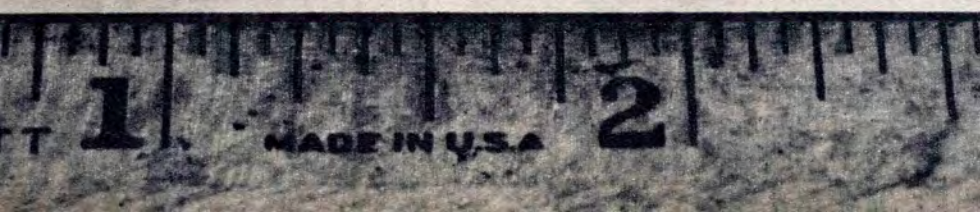
**Don't be fooled by the size of Robert Abel's miniature guns. Though they look tiny, they pack wallop**



During World War I, many American boys came face to face with the big edition of this rifle, a German Mauser. The miniature version is authentic in every detail, has workable breech, shoots scale cartridges. The guns shown here, part of a collection owned by Robert Abels of New York City, are the work of professional gunsmiths who build 'em in their spare time.



French type percussion dueling pistol of the 1850s. Measuring under two inches, the little gun is a masterpiece of handcraft. Like its mates in the collection, it is a working model, is also part of a set, fully equipped as dueling pistols were in those days. Mr. Abels has in his possession other little gems such as a miniature derringer, a ".45" caliber Colt automatic.





# SPECIAL FOR THE R/C NOVICE

■ The relay is the heart of any receiver installation. Its job is to send control signals to the actuator which exactly duplicate the action of the transmitter key switch. When properly adjusted, the relay will faithfully reproduce the control signals and the actuator action will appear to be directly operated by the key switch, just as if there were no transmitter, receiver and relay in between. If the relay is not properly adjusted, it immediately shows up in the actuator action which lags behind, skips signals, or operates without signals. Of course, improper transmitter, receiver or actuator operation can also be the cause of such trouble, but assuming they are correct, it is the adjustment of the relay which determines proper actuator action.

In addition, it is also important to use the proper type relay with a given receiver. Some receivers can use only the highest quality and most efficient relays, yet others operate as reliably with cheaper, smaller, lighter or less efficient types. The determining factors are the range of current change provided by the receiver and how well a particular relay will operate within that range.

It doesn't matter whether a receiver idles at high current which drops when signalled or if it idles low and jumps up with signal. In either case, there is a limited range of current change within which the relay must be able to operate reliably. This article suggests a basic adjustment procedure for most relays and discusses details of several popular makes to show how different features determine the best operating range.

Most relays are basically the same in that they have a coil of fine wire wound on an iron core and near the core is a pivoted or loosely mounted iron piece called an armature. The armature is held away from the coil by a spring or, in the case of a polarized relay, a permanent magnet. With enough current flow through the coil a magnetic attraction is built up which overpowers the opposing spring or magnet and draws the armature toward the coil. This action is referred to as "pull-in."

If the current flow is reduced enough, the spring or magnet is able to release the armature from the lessened coil pull. This action is referred to as "drop-out." Contacts are positioned at the extremes of movement so that the armature motion makes or breaks a circuit to an actuator or other device.

General adjustment for most relays begins with setting clearance between the coil core and the armature, with the latter in the pulled-in position. With no current flow through the relay, it will be necessary to manually hold the armature pulled-in. In this position, the contact point which the armature rests on should be adjusted so that the armature almost but not quite touches the coil core. The separation is about right for most relays if a common index card will

just slip between the surfaces. The armature should not touch the coil core, particularly if the relay current does not drop to zero for release. A residual magnetism tends to build up if the surfaces touch and this can hold the armature after the relay is de-energized.

Once pulled-in, the armature can be held with very little power unless opposing tension is excessively high. A preliminary gap setting should also be made at this time. This is done by adjusting the opposite contact point so that in the drop-out position the armature is about  $\frac{1}{32}$ " away from the coil core—three thicknesses of index cards is about right.

Following these initial adjustments, an operational check should be made to determine final settings. This is done by varying current flow through the relay by means of a "pot" (short for potentiometer, also called a rheostat or variable resistor). With the relay in the receiver circuit, a pot of about 25,000 ohms may be used in the B plus lead to vary the current through the desired operating range. The pot may be built into the receiver installation or may be used externally in series with the receiver meter.

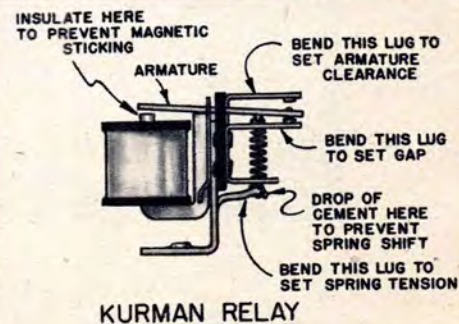
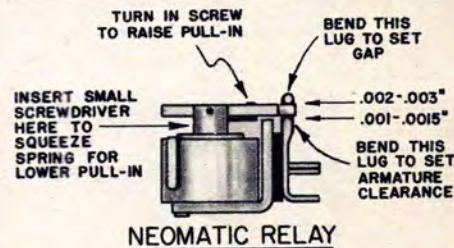
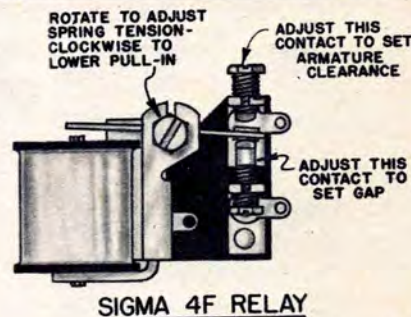
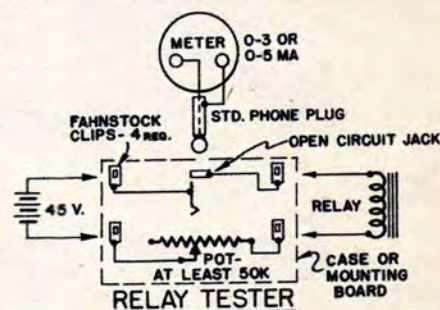
For bench use, the separate relay test circuit shown provides a convenient means of making adjustments without the need for operating the receiver. Whatever the method used, varying resistance with the pot raises or lowers the current so that with a milliammeter in the circuit the exact points of pull-in and drop-out may be determined. The idea is to watch for armature movement and to note the current reading at each change of position. Remember too that a polarized relay requires proper connection for correct operation. Usually a red dot is provided to indicate which coil lead goes to B plus.

First, set the pot so that the meter shows the normal maximum current for the type receiver with which the relay is used. If the armature is not pulled in at this point, lower the spring or magnet tension until it does pull in. (With a polarized relay of the E. D. type, which has no spring, this is done by adjusting the contact screw to increase the clearance between the armature and the magnetized pole.) If already pulled-in, check the current value at which pull-in occurs by slowly varying the current with the pot while watching the armature movement. If the armature pulls in at least .2 to .3 ma. below the normal maximum receiver current the adjustment may be considered acceptable; if not, reduce the tension adjustment further until such pull-in is obtained.

Next, check the drop-out point by continuing to lower the current and note the value at which the armature is released. If at least .2 or .3 ma. above the normal minimum receiver current, this adjustment is also acceptable; if not, the drop-out point (Continued on page 88)

## What You Should Know About Relays

By JOHN WORTH



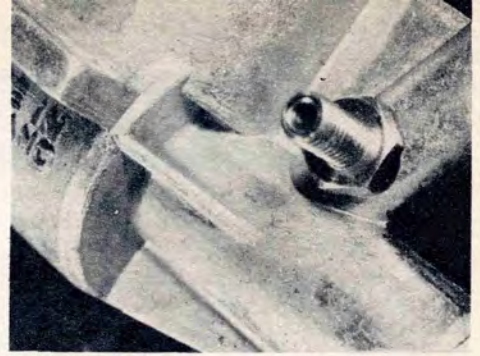




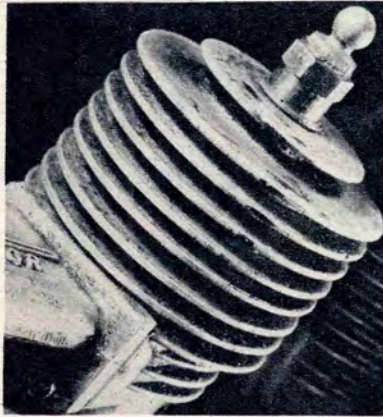
#1—This foreigner is:.....



#2—Bare facts needed here:.....



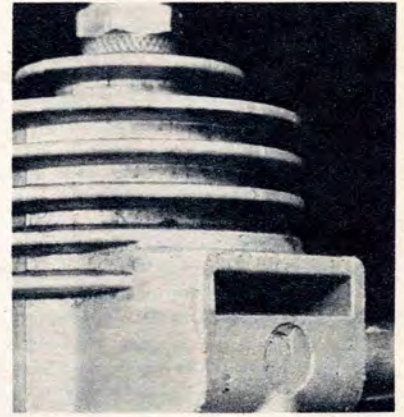
#3—Non-American job:.....



#4—That "OR" will fool you:.....



#5—Easy one, hey?.....



#6—Remember this?.....

## Got an Eye For Engines?

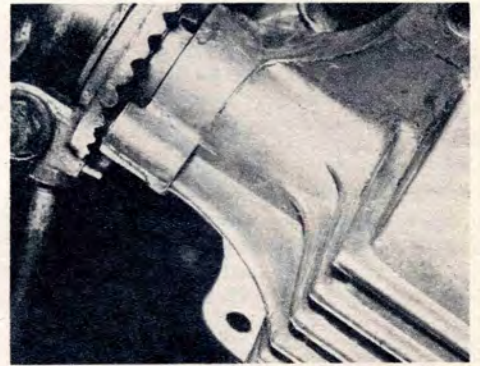
Then you should breeze through this photo-identity quiz. John Schneider who took the pictures says if you get them all you're a whiz First Class; with one wrong, Regular Whiz; two, Jr. Whiz; three, Gee Whiz.



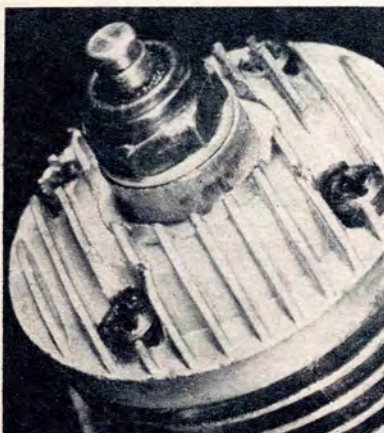
#7—Two good reasons:.....



#8—Long-time favorite:.....



#9—Terrible wind:.....



#10—Hard-worked Westerner:.....



#11—Lotza these around:.....



#12—Wee one:.....

#1—Mills .75 cc diesel; #2—Herkimer Cub Diesel; #3—Allbon Spitfire; #4—Rocket; #5—McCoy .049 Diesel; #6—Synco "B"; #7—Elf Twin; #8—Bantam; #9—Cyclone; #10—Cameron .19; #11—O&R .29; and #12—Baby Spitfire. How'd you do? 100%?



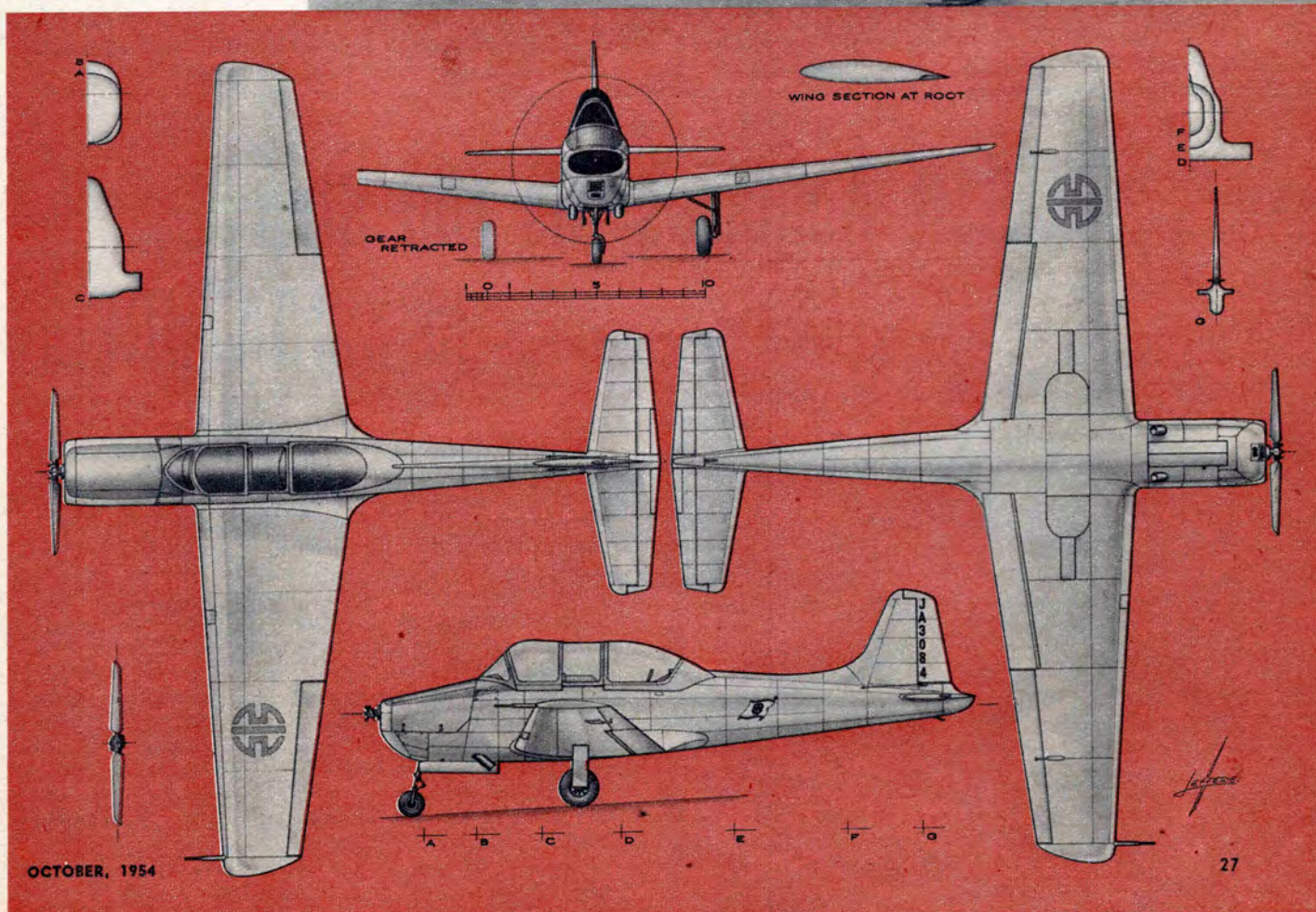
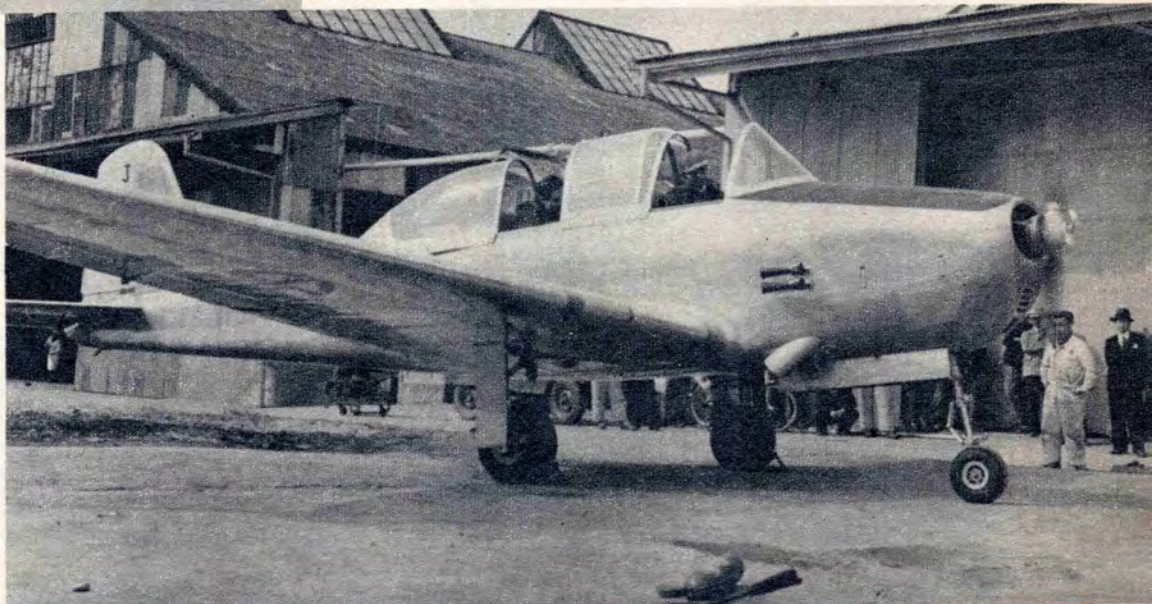
JAPAN'S NEW AIR FORCE TRAINER:

# KAWASAKI KAT-1

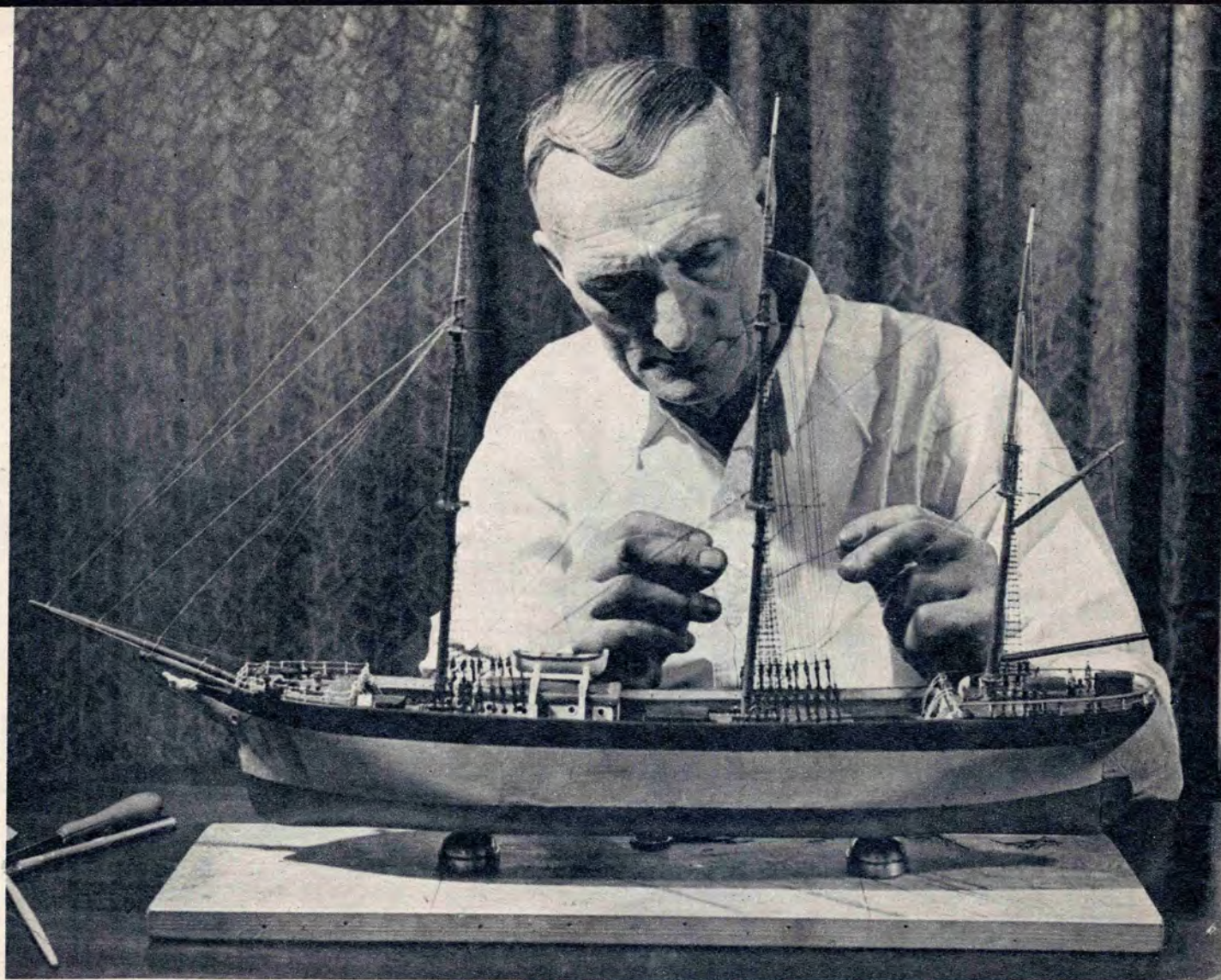
Drawings by WALTER JEFFERIES

Famous World War II aircraft concern  
builds trainers for the Japanese AF

Japan's aircraft industry, virtually destroyed during World War II, is slowly building up, with assistance from the U.S.A. One of the most progressive firms is Kawasaki Aircraft Co., well known for its military airplanes and engines, which recently acquired licenses for the manufacture of Lockheed T-33A jet trainer, F-94C all-weather fighter and Bell 47D helicopter. It has already designed and produced its own KAL-1, four-place liaison plane, and is now building the KAT-1 all-metal two-place primary trainer, powered by a 240 hp Lycoming engine and capable of 185 mph top speed.







Olaf Jordan putting finishing touches on "Hazel Craig." Ship was built from actual plans, scaled to required proportions. Reputed to be the fastest Clipper ship of its time; credited with averaging 287 miles per day for seven days straight, passing larger ships.

## Ex-Salt Acquires His Old Ship . . . in MINIATURE

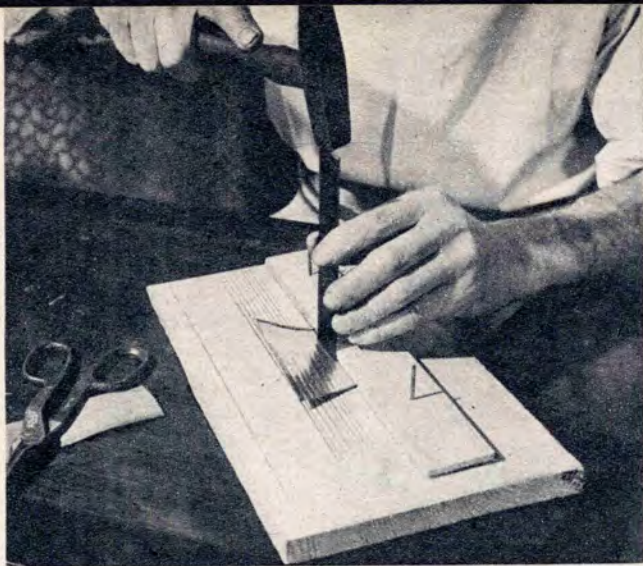
Realism is the keynote of Jordan's ship models. Rear deck and rigging of Preussen are alive with sailors as ship heads with wind.



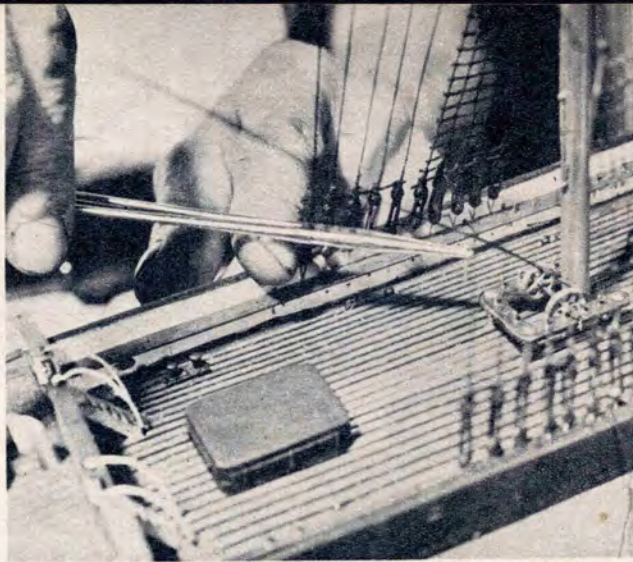
When Olaf Jordan, who currently engineers heavy machinery installation in New York City, was a young man, he spent his happiest days aboard the fast Clipper ship "Hazel Craig." This beautiful three-masted barque was often referred to, in those days, as the "mysterious traveler" and the "sea witch" because of the rapidity with which it sailed from port to port. It was built of metal by the famous Clipper builder Alexander Hall of Aberdeen, Scotland, and her hull is still afloat. Jordan was so taken with the ship and her efficiency at sea that he decided to relive the experience by building an accurate model of the Hazel. No newcomer to the art of miniature ship construction, he built two others, the Preussen and Mary Celeste. It took him over a year to complete the model of his first love. Accuracy of detail is his motto, and short cuts are not tolerated. The camber of the deck, the rake of the masts, the yards, everything must be correctly carved, all fittings accurate.

Air Trails HOBBIES For Young Men

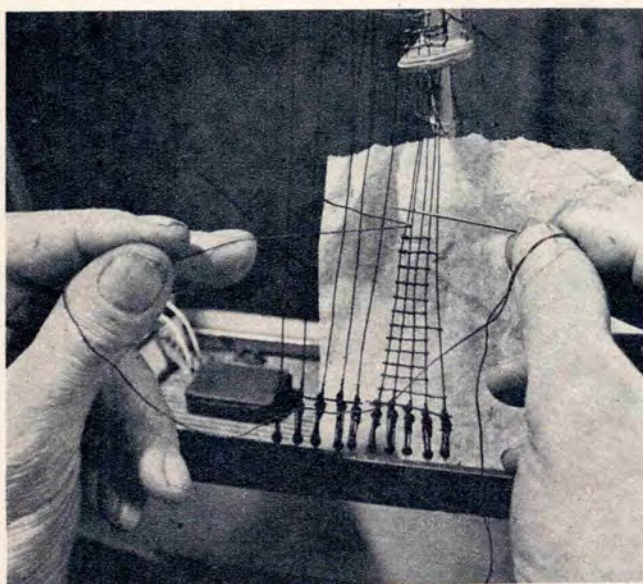




Sails are made of sheet aluminum to permit a bellied look when bent into proper shape. Rope lines are simulated by running lines hammered into the metal, sails then painted white.



The model has 120 belaying pins, same number as on the full scale ship. They are so small they must be inserted with forceps. The spars, all of different sizes, have microscopic pulleys.

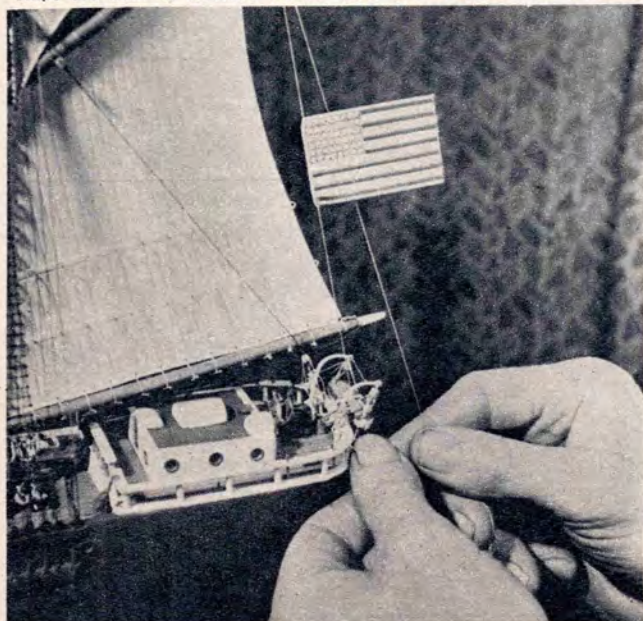


Jordan is one of the very few ship model makers to tie clove hitches instead of gluing them. This is precisely the way hitches are made on actual ships. More than 1260 such knots on Hazel Craig.



Water barrel is brought aboard the Preussen by means of forceps. This five-master is Jordan's most elaborate model, requiring almost three years of his spare time to complete. Everything to scale.

A hand-embroidered flag, made by Jordan, is run up on the Mary Celeste. Like his other models, this one is also fitted with personnel. Ships are built of selected wood. Sheer of hull is cut with an adze.



Mary Celeste was one of the most mysterious ships of modern time. Was found floating on the high seas without a single member of the crew aboard. Secret of their disappearance never solved.



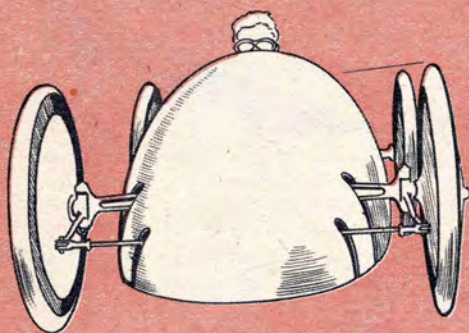
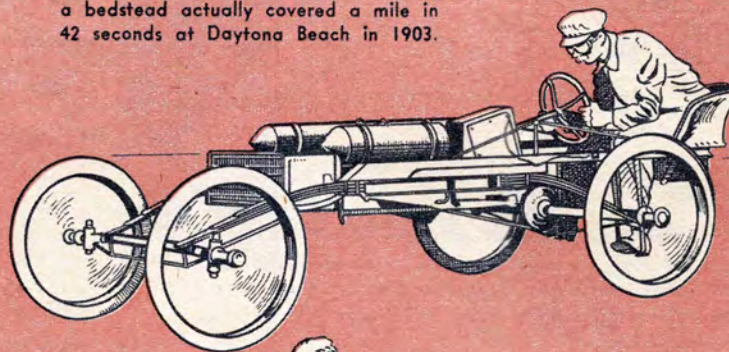


# AUTO Progress

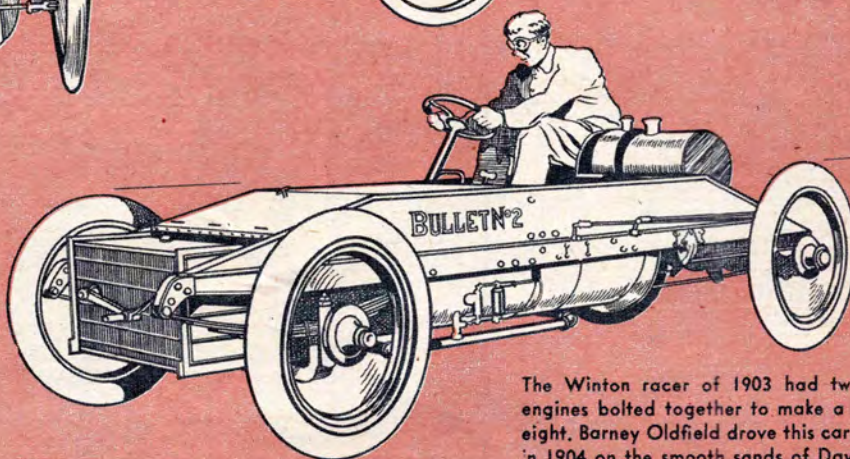
By DOUGLAS ROLFE

## Development of Racing Cars 1894 - 1906

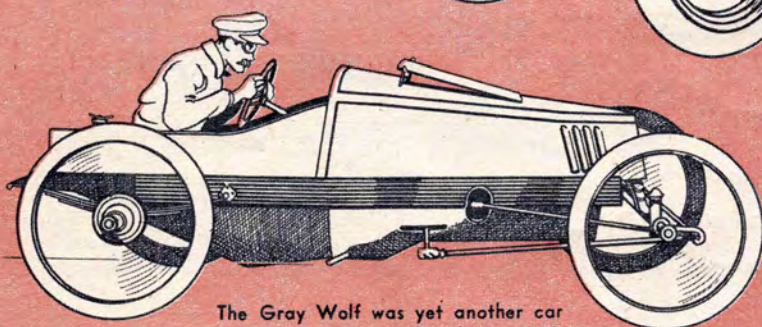
This curious Oldsmobile racer resembling a bedstead actually covered a mile in 42 seconds at Daytona Beach in 1903.



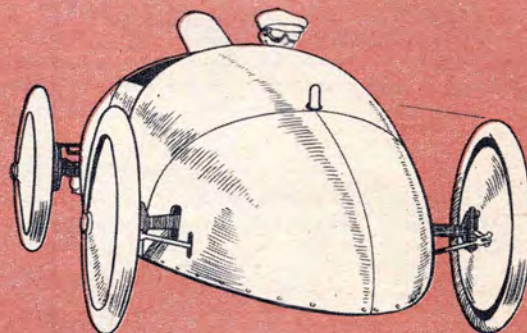
The Baker electric "Torpedo Kid" was another Daytona racer. This 1904 design was remarkable for high degree of streamlining; looks modern!



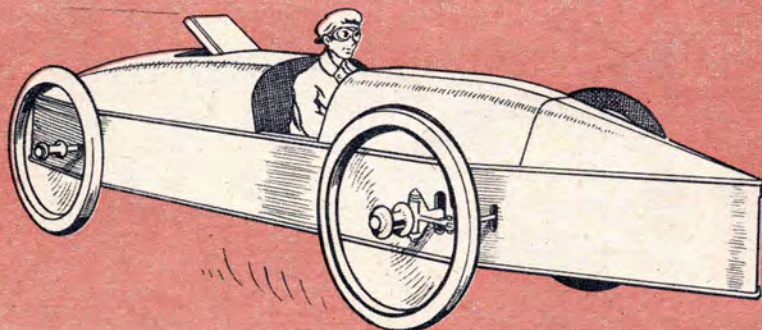
The Winton racer of 1903 had two 4-cylinder engines bolted together to make a flat straight eight. Barney Oldfield drove this car at 83.7 mph in 1904 on the smooth sands of Daytona Beach.



The Gray Wolf was yet another car raced at Daytona Beach in 1904.



The 1904 Ross "Tea-Kettle" was a steamer—and also remarkable for its streamlining.

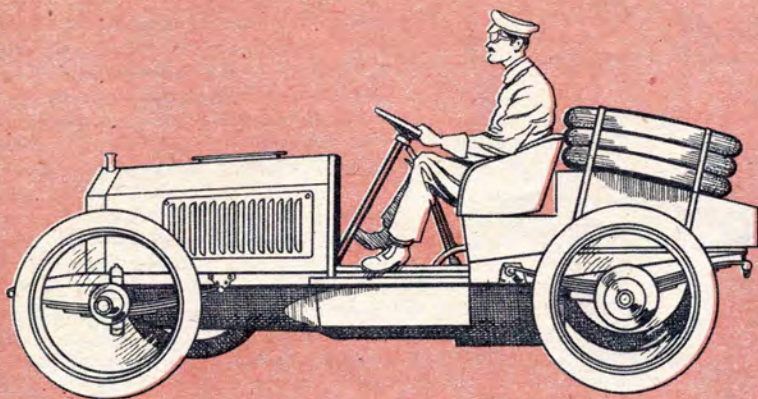


Most famous steam racer, the Stanley Steamer (left) hit 127 mph at Daytona Beach in 1906. Later, in 1907, Fred Marriot actually attained 190 mph before losing control and cracking up. Engine was a 2-cylinder affair and weighed only about 200 lbs.

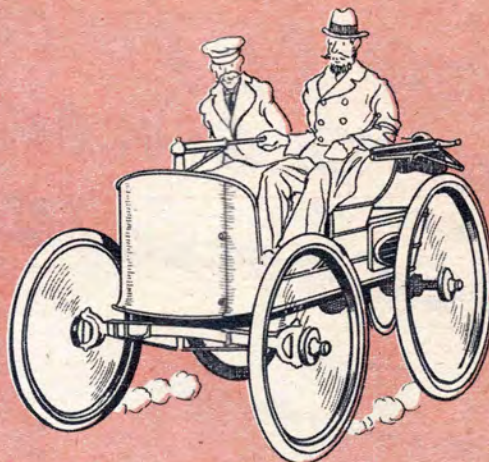
Auto racing goes back to the turn of the century when closed mile records were set on the hard-packed sands of Daytona Beach in this country and road races were inaugurated both here and abroad. Probably the first racing event was the Paris-Rouen race which took place in France in 1894.

This in turn inspired the Times-Herald races in Chicago, 1895. As the winning car in this latter event suggests, these early road races did not involve specially designed racing cars but were comparable to the stock car races popular today. The Daytona speed events were of a very different nature; they

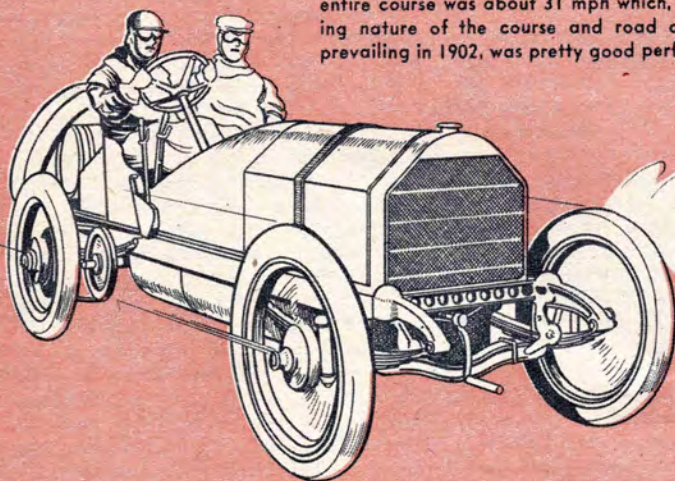




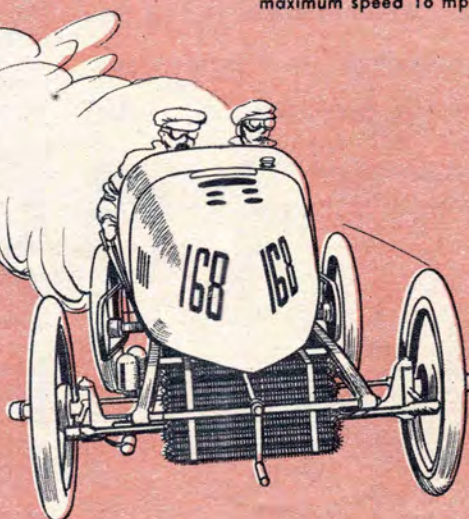
Winner of first Gordon Bennett road race was this 40 hp British Napier. Its average speed over entire course was about 31 mph which, considering nature of the course and road conditions prevailing in 1902, was pretty good performance.



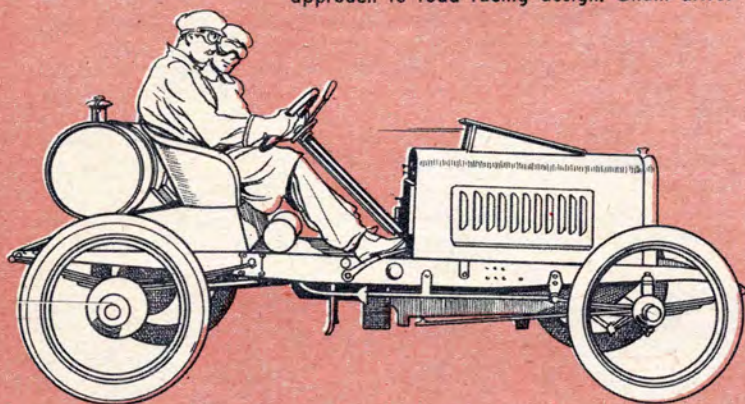
The Times-Herald race in Chicago, 1895, first such competition in U.S., was won by this Duryea Motor-wagon. It had two parallel cylinders (each could operate independently), 4 speeds, friction clutches, maximum speed 16 mph!



Mercedes, still one of world's top sports cars, was one of the earliest and speediest racers. This 120 hp, 1905 model is typical of the early approach to road racing design. Chain drive.

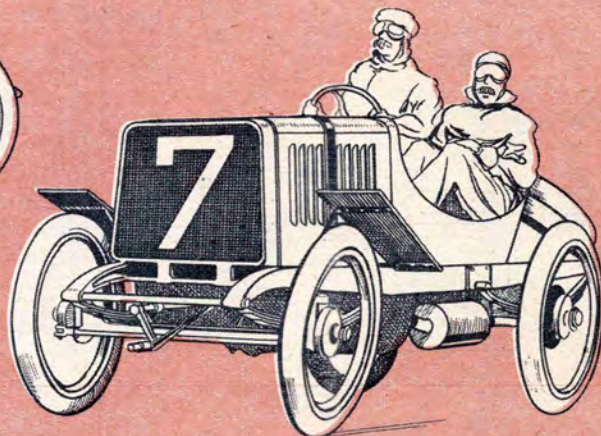


This 70 hp Mars, a French production, won the gruelling 1903 Paris-Madrid road race.



Hemery nosed out Heath with this 80 hp French Darraq to win 1905 Vanderbilt Cup Races. Note large gas tank and inclined chassis due to large rear wheels.

Heath's 90 hp French Panhard which won the first (1904) Vanderbilt Cup Races. This is an excellent example of the very early racing car designed for difficult roads of period. Large bore powerful engines prevailed.



frankly sought to evolve high-speed cars totally unsuited to the rigors of road racing. A selection of some of the more interesting Daytona racers occupy entire left page. Right page: shortly after 1900 a whole series of road-racing events came into being. The Vanderbilt Cup Races here and the

Paris-Madrid, the Paris-Berlin and, more important, the Gordon Bennett classics abroad. At the close of the period covered here the Gordon Bennett races were giving place to an even more grueling event—the Grand Prix races, also run off yearly in France, and track racing was becoming common.



# How to become a trained Technician

**Junior Engineer, Lab Assistant, Draftsman—need for Technicians is tremendous. Info on pay, training, jobs!**



RCA Institutes, Inc.

**Electronics Technicians** are now critically needed, both by industry and government. Photo: studio and control room practice.



Rochester Institute of Technology

**Photographic Technicians:** Use of color helped increase demand. School courses offer the training to earn "big money" available.

■ Maybe you can't go to college. Sheer lack of money or family obligations may make "on to college" impractical. It's possible you don't have enough math and science for the kind of career you'd really like—meaning you can't meet the college entrance requirements. Or perhaps you feel that four more years of school constitute too large a slice out of your life before starting in to earn a living.

If you're interested in science or engineering, that last-named potential reason for quitting your education after high school may be a very short-sighted view just looking at dollars and cents. But whatever the reason, don't give up in despair and grab the first job that comes along. *Because you can still become a technician.* By approximately two more years of training, much or most of it at the college level, you can still enter the technical or scientific field of your choice, fit yourself to earn an excellent salary, and have both industry and government vying for your services.

As is true of training for a professional engineer, that for the technician qualifies him to hold down a multitude of inter-related jobs instead of only one or two. If you should decide to work for a college degree after graduating as a tech-

nician, you will find a number of colleges glad to credit you for the courses taken at certain schools. Another "bonus" fact: at certain schools, under the cooperative program for technicians, it is possible to earn two and a half times as much money as your essential school expenses!

The "technician" is the fellow who's halfway between the engineer and the skilled craftsman. (For the purposes of this survey, we'll confine ourselves to engineering and science in regard to types covered.) His job is semi-professional, in such fields as electronics, aeronautics, building construction, photography, mechanical technology and the like. He is known under such titles as Engineer's Aid, Junior Engineer, Laboratory Assistant, Laboratory Technician.

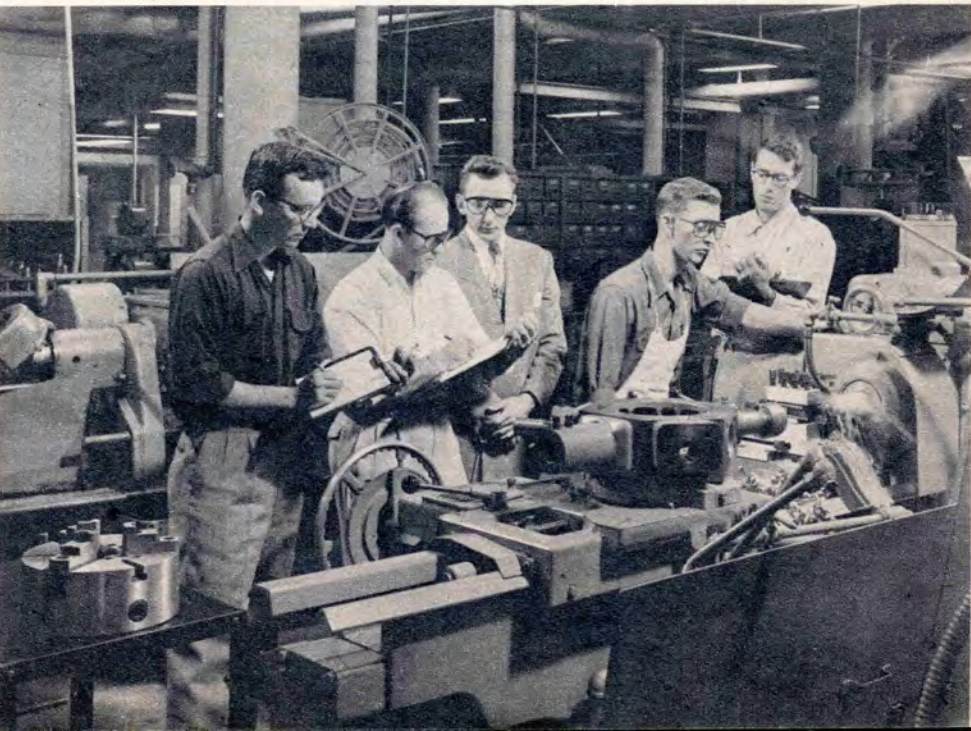
It is estimated that today at least five technicians are required for every professional engineer—and you've heard plenty about the shortage of engineers. In just the last ten years, or from the time you probably got your first bicycle, the expansion of industry and industrial research and development have created the need for the job of technician. The very shortage of engineers will make him "help wanted" far into the future, as will national defense needs, the spiraling research toward new products in industry, and the increasing use of technicians in sales and supervisory capacities.

There's a whole new world there for the taking—with a start as technician you can win positions up to the very top. But to become a technician you need training. This may be had at technical institutes, junior or community colleges, extension divisions and evening sessions at colleges and universities, correspondence or "home study" schools, schools connected with industry, various proprietary schools, and through apprenticeship.

*What's the pay in these technician jobs? How much do I shell out for the schooling? Just what do you take in the different courses, and I mean by subject? What different kind of jobs could I get*

**Growing field** is that for Industrial Technicians—whose jobs are along the lines of the ones held by industrial engineer. In photo, student at left participates in time-study class.

General Motors Institute





*in any one field—maybe I want to switch around, move up? Put it on the line: what kinds of technician jobs need men the most?*

### In Electronics—Critical Need

The electronics technician is one of three types of technicians in the List of Critical Occupations issued by the U. S. Department of Labor. The electronics field, of course, is still in its infancy—but what a baby! In television, F.C.C. only several years ago upped its allocation system to accommodate more than 2,000 broadcast stations throughout the country. Since the war, the number of electronic gadgets in large aircraft has doubled twice. Geology, medicine, police departments—these are just taking their first astonished look at the possibilities of electronics as a help in carrying on their work.

To find out about electronics training, let's meet Elmer Harger, a student who's learning to become that kind of technician at RCA Institutes in New York City. This recognized school, whose Advanced Technology course is accredited by the Engineers Council for Professional Development, is one of the oldest radio schools, dating back to the Marconi wireless days. Elmer is 20, was born and raised in Hawaii, graduated from Theodore Roosevelt High in Honolulu.

Elmer has a crew cut and perhaps more right than Statesiders to the typical short-sleeve Hawaiian sports shirt worn by him on the warm day of our visit. He once built rubber-powered modelplanes and "fiddled" with a modelplane engine, but his interest soon turned to amateur radio. Has had his Ham license since July '51, call letters KH6NEZ. With little more than half a year's time to be active before he took off for the States to study, he did manage to work North America, Australia, New Zealand, Africa. Farthest contact was South Africa, 12,000 miles, where he used to contact a father and son in the Johannesburg area.

As a Ham, he was interested both in working stations and rebuilding equipment—but not in "rag chewing" or "trafic handling."

As of this writing, Elmer has about three months to go to complete the two-and-one-quarter year Advanced Technology course. This course in electronics is at the college level, requires a high school education, and has a minimum entrance age of 17. It qualifies graduates for direct employment in laboratory development work in radio and electronics, operating and development work in broadcast, television and other stations, and factory test work on all radio transmitters and receivers.

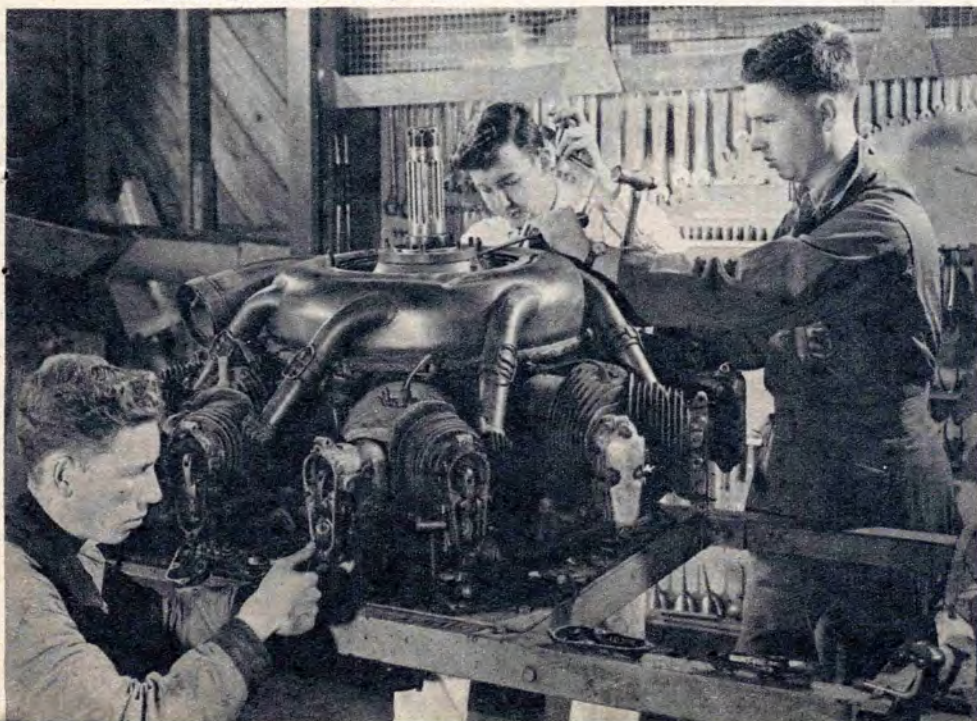
What is such a course like? The first three months, Elmer reports, were elementary—a sort of specialized review at the high school level. After that, straight college stuff. During the first year he found that "speed reading" in the English course really worked, and public speaking on a tech topic and practice in writing tech reports had a point. He got six months of technical drafting that first year—"seemed too long and much at first, but soon found I needed it all to draw circuits, for lab and tech reports the whole rest of the course."

In physics, he had four terms in general physics the first year—motion, heat, sound and light. Math? Almost two years, much of it at the senior college "and even postgrad college level—take the La Plasse system of transforms for solution of differential equations." He adds, "And believe me, every bit of the math had a practical application to electronics."

Student Harger has already had his field trips to industrial and research installations in the New York area. (On the tour of NBC in Radio City he was most impressed by the master control set-up for broadcast and TV.) However, at this time he still has not taken one of the final subjects—three months of color television. Nor has he yet become eligible for the Senior Assemblies, a free, once-

**Aeronautical Engineering Technician**, besides strictly engineering projects, may be employed in field work, sales, inspection, or help in research, or act as liaison man.

Long Island Agricultural & Technical Institute



Purdue Technical Institute

**Trained technicians in chemistry** may become laboratory assistants, chemicals salesmen, pilot-plant operators and the like.



RCA Institutes, Inc.

**High-caliber, advanced courses in electronics** qualify the student technician for many positions in radio, TV, lab, testing.



Purdue Technical Institute

**Extension Divisions of universities** give the shorter courses for technicians. These new Purdue men are buying identification hats.



## HOW TO BECOME A TRAINED TECHNICIAN



Univ. of Dayton Technical Institute

**Drafting** offers all kinds of opportunities for today's technician. There is critical shortage in Engineering Drafting Design.



International Correspondence Schools

**Home study** courses as well as resident schools provide training for technicians. (Student doing steam engine exams.)



L.I. Agricultural & Technical Institute

**State-operated** tech schools like New York's L.I.A.T.I. give training too. This "Construction" student finishes home model.

a-week three-month program open to near-grads wherein students may listen to guest speakers from Sperry, RCA, Bell Labs and the like tell about their firms' activities and how to get a job there. Also in the offing for Elmer is the F.C.C. exam for First Class Radio Telephone License required of all graduates.

Just now the Army is "breathing" on technician trainee Harger. As with all electronics graduates, the chances are practically 100 percent that he will be given military assignment in his own occupational field. After completing his service he plans to go on to college and become an electronics physicist. (Advanced Technology at RCA Institutes is accepted for credit toward a degree by most colleges and universities.)

Surveys show that electronics technicians anywhere receive an average starting salary of \$75 to \$95 a week. With experience under his belt, a man can advance to foreman or supervisory positions, or set up his own business—or turn inventor, as graduates have. There's no ceiling once you're "in."

It might be pointed out that RCA Institutes, located at 350 West 4th St., New York 14, N. Y., is a school for the general public. Like many other such private or corporate-owned schools it operates its own placement service—but the Radio Corporation of America gets no more preference than any other firm or government agency in securing graduates.

RCA Institutes is also on the approved list of the National Council of Technical Schools, a non-profit approval agency for proprietary schools that offer you courses in the semi-professional technical field. Other schools on this list which have courses for electronics technicians are:

Capitol Radio Engineering Institute, 16th and Park Row N. W., Washington 10, D. C. Central Technical Institute, 1644 Wyandotte St., Kansas City 8, Mo. Chicago Technical College, 2000 South Michigan Ave., Chicago 16, Ill. Indianapolis Electronics School, 312 E. Washington Ave., Indianapolis, Ind. Milwaukee School of Engineering, 1025 North Milwaukee St., Milwaukee 2, Wisc. National Schools, 4000 South Figueroa St., Los Angeles, Calif. University of

Houston, School of Technology, 3801 Cullen Blvd., Houston 4, Tex. Valparaiso Technical Institute, Valparaiso, Ind.

### University Extension Courses

A source of technician training not to be overlooked is the "extension" program offered by many institutions of higher learning. In this case you are going to a particular college or university in all but location—the "extension centers" usually being in other towns where they'll best serve their purpose. Thus, Purdue U. operates the Purdue Technical Institute which offers two-year courses at Fort Wayne, Hammond and other places throughout the state. Each center has its own buildings and labs. Graduates receive diplomas as Associate Technical Aide or Technical Aide. If you don't have a high school diploma, evidence of an equivalent background of experience will be considered to let you enter.

Penn State recently added a two-year course in Drafting and Design Technology to its Engineering Extension program. Such programs are constantly being augmented to meet growing industrial needs. It would be wise to check with your state university to learn "the latest" in regard to "terminal" courses. (Meaning the kind fashioned to fit you for immediate employment in some relatively restricted field.)

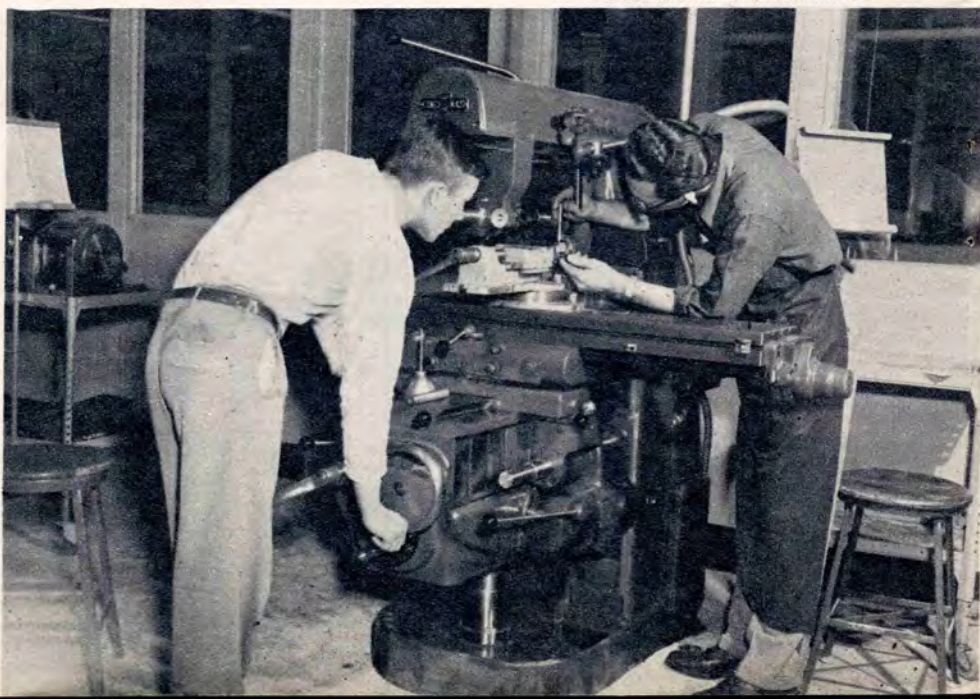
Here's another angle to extension education. Individual companies often make an arrangement with schools whereby employees may take specialized courses there at the company's expense. Inland Steel of Indiana has such a setup with Purdue, permitting employees to attend the Calumet extension center for training as mechanical, electrical, chemical and metallurgical technicians.

### Industry Schools

A particular industry or organization may conduct its own school. An outstanding industrial school is General Motors Institute, Flint, Mich., which confers baccalaureate degrees in engineering and business administration. In addition, the

**Mechanical technicians** are much in demand by industry—tool designers are among those on list of critically needed. These R.I.T. students at work on milling machine project.

Rochester Institute of Technology





Institute carries on a Spare Time Training Program which includes technician training as considered here. The program is for the benefit of employees, to help them upgrade themselves or enter other kinds of jobs in the GM organization, though no guarantee is made in either case. Representative courses: industrial air conditioning (2 yrs.), tool or die design (3 yrs.), drafting (2 yrs.). Classes meet one or more times each week. In drafting, the cost to the employee is \$57 for each of the three terms of the first year, \$42 per term the second year.

#### Tool Designer—Critical Need

Another type of technician whose need is critical as reported by the U.S. Department of Labor is the tool designer—who belongs under the general classification of mechanical technician. More and more industry is making greater use of special tools, and new products often require complex retooling. National defense alone calls for a great deal of tooling in machining operations. The vast need for this technician will continue.

The tool designer is an essential part of the engineering team. He helps develop the tools as well as selects the machines required for speed and accuracy. Actually, the skilled tool designer is an inventor, draftsman and mechanic rolled into one. He must have imagination, for he will be asked to design new dies and jigs for cutting purposes. A knowledge of drafting is essential, to get his ideas across to the toolmaker. And he must know just how tools work—have a good background in math, mechanics and the physical properties of his materials.

Proper training for this technician can lead to all kinds of jobs—besides tool designer and tool and die maker he can become an estimator, foreman, salesman, or on up to chief tool designer, production manager, tool engineer. He can find openings in mechanical drafting, technician jobs in welding, forging operations, mechanical lab test work.

Schools offer one of the best ways of

getting into tool designing, for the courses are highly selective, yet broad enough in scope to take in a wide potential job spread. There are other ways. A plain draftsman, for instance, can acquire enough machine shop practice to get into tool design work. Tool and die makers may also thus go up the ladder through special training in tool design, drafting and math.

Various kinds of technical institutes offer tool design in their mechanical technology department, complete with shop and lab. There may be one near you. Schools on the roster of the National Council of Technical Schools which conduct such courses are:

Alliance College—Technical Institute, Cambridge Springs, Pa. Chicago Technical College, 2000 South Michigan Ave., Chicago 16, Ill. Finlay Engineering College, 10th and Indiana, Kansas City, Mo. Lain Drafting School, 601 North Delaware St., Indianapolis, Ind. Milwaukee School of Engineering, 1025 North Milwaukee St., Milwaukee, Wisc.

The tool designer, along with his two fellow "critical" technicians the electronics man and the engineer design draftsman, may get special consideration in regard to military deferment if employed in essential industries.

#### Home Study Courses

The correspondence schools—the ones that teach courses by mail—have earned a definite niche in technician training. They offer a number of basics, are a boon to those distant from resident schools. Many "junior colleges" have tie-ins with the home study schools whereby students, under the supervision of their college instructors, acquire knowledge by mail in subjects which their own school does not have the facilities to give. For men in the service, the government-sponsored Armed Forces Institute at Madison, Wisc., uses the private correspondence schools to offer instruction in a wide variety of subjects open to military personnel. And corporations, seeking to help employees better themselves on the job, have similar arrangements for their workers.

(Continued on page 74)

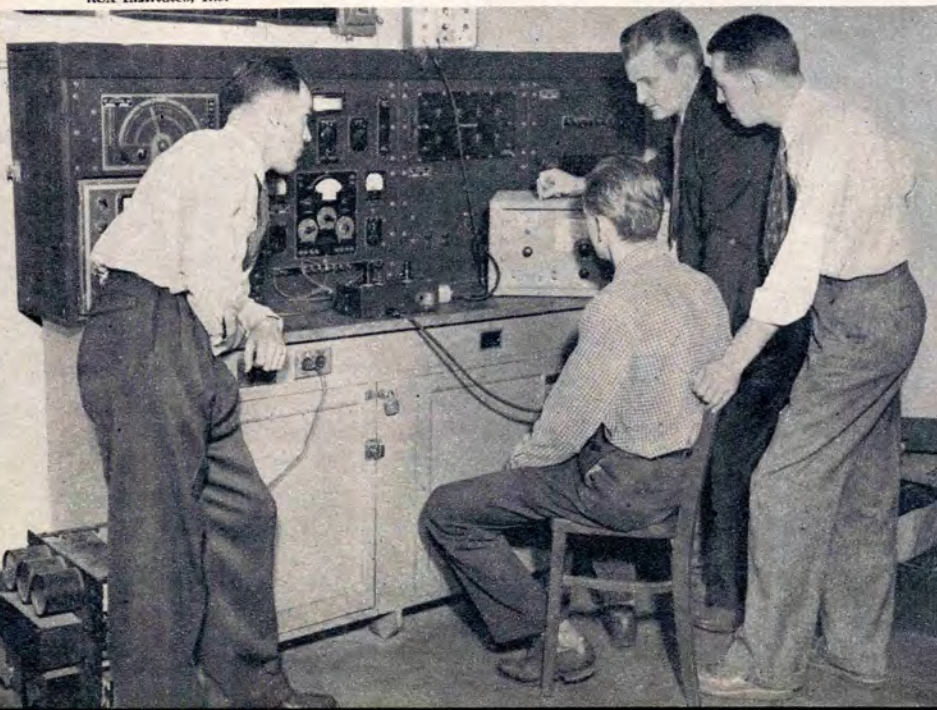
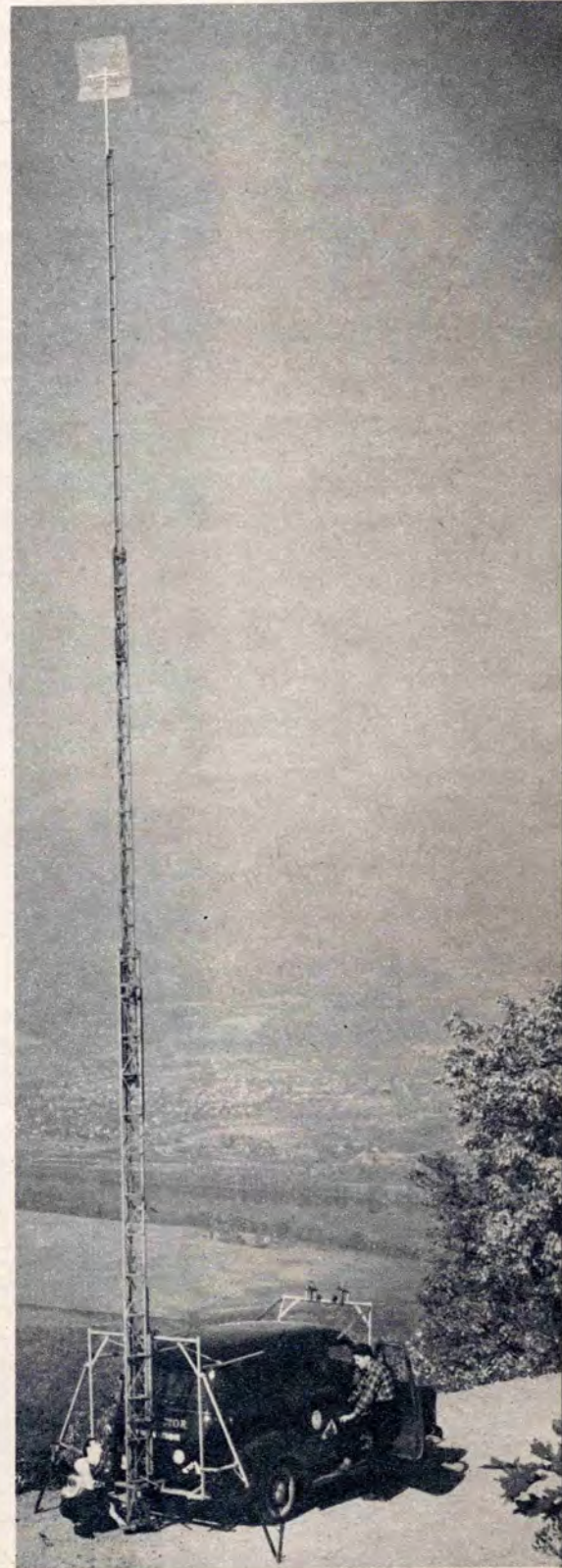
**Television** (RCA survey truck tests signal strength in right photo) only one phase of electronics. Trained technicians, like students below, may enter many phases of expanding field.

RCA Institutes, Inc.



General Motors Institute

**Industry** schools also help make technicians. General Motors Institute has such a program for benefit of its employees.





# AIR PROGRESS

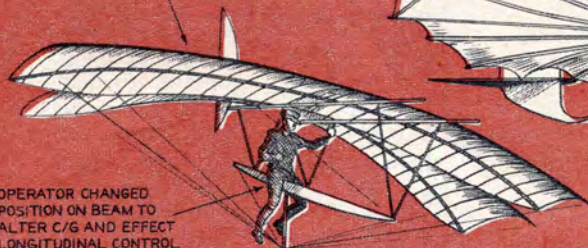
By DOUGLAS ROLFE

## Motorless Flight



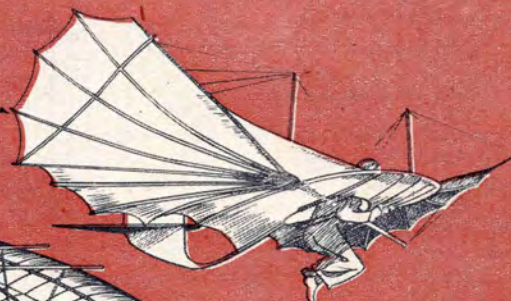
Chanute glider, 1896  
first U.S. successful motor-  
less craft.

NO PROVISION FOR LATERAL CONTROL



OPERATOR CHANGED  
POSITION ON BEAM TO  
ALTER C/G AND EFFECT  
LONGITUDINAL CONTROL

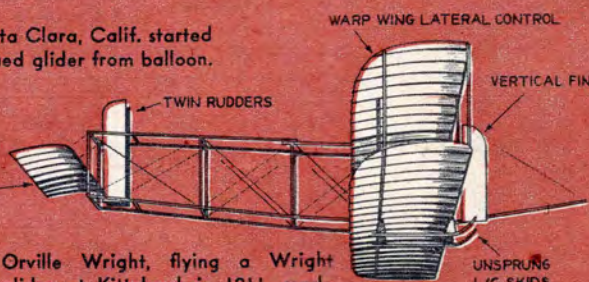
J. J. Montgomery of Santa Clara, Calif. started  
on gliders in 1883. Launched glider from balloon.



Typical Lilienthal hang glider,  
1895. Controlled by shifting  
one's weight.



Aachen "Schwarzer Teufel" de-  
signed by W. B. Klemperer in  
1920 was one of the first high  
performance gliders.



Orville Wright, flying a Wright  
glider at Kittyhawk in 1911, made  
first soaring flight, 9 min. 7 sec.

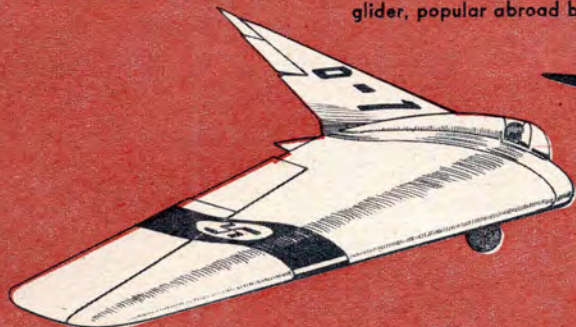
ZOEGLING TYPES DATE  
FROM 1914—WERE ORIGINATED  
BY WILLI MESSERSCHMITT, THE  
WELL-KNOWN AVIATION ENGINEER



Ziegling, typical German trainer  
glider, popular abroad but not in U.S.



Pruefling, secondary trainer, several of which  
were brought here in 1928. One launched from  
dirigible Los Angeles, piloted by Ralph Barnaby.



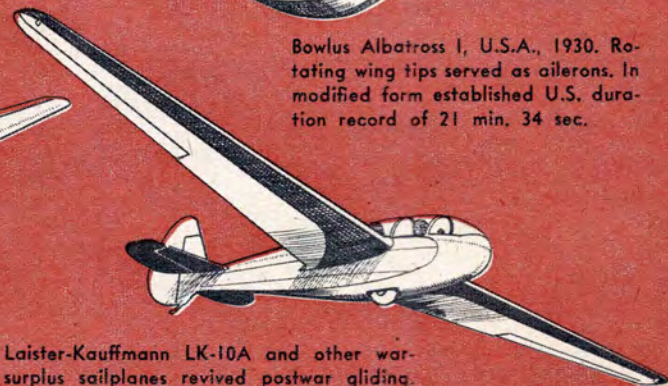
Horten II, 1937. Success of flying wing  
owes a lot to this radical sailplane.



Bowls Albatross I, U.S.A., 1930. Ro-  
tating wing tips served as ailerons. In  
modified form established U.S. dura-  
tion record of 21 min. 34 sec.



Fauvel "Monobloc" AV 36, 1953. A very success-  
ful French design for which plans are available.

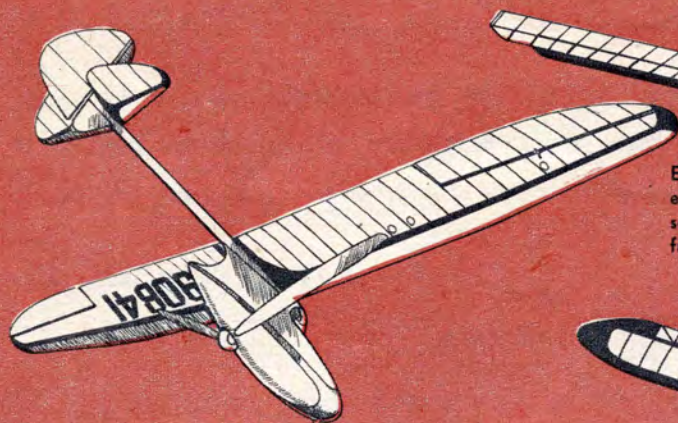


Laister-Kauffman LK-10A and other war-  
surplus sailplanes revived postwar gliding.

Motorless flight antedates powered flight by at least eight years. Though numerous attempts to achieve it were made long before Lilienthal, the great German pioneer was first to succeed. But it was not until the Wright brothers soared their glider on the slope currents of Kitty Hawk that its true potential became apparent. The evolution of the powerplane

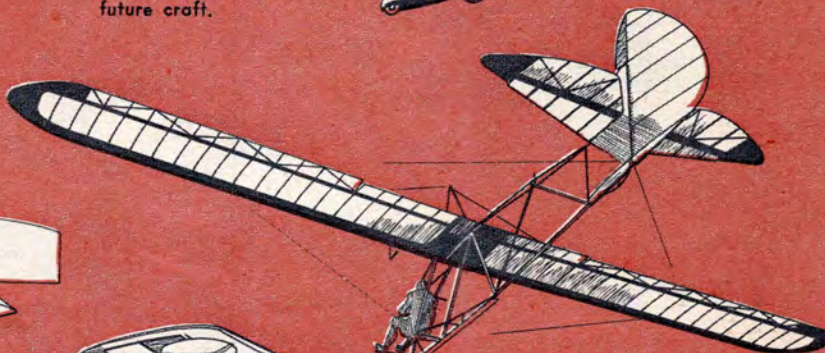
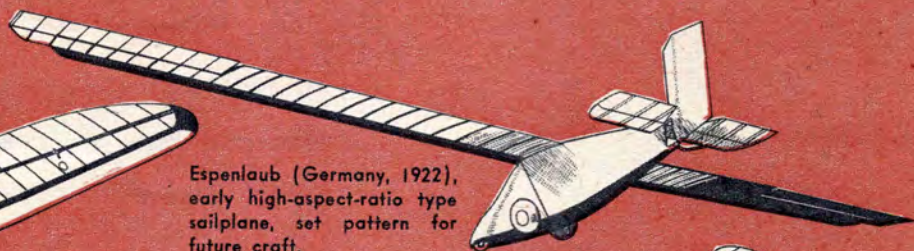
obsured developments in motorless flight until after World War I, when Germany, deprived of power flying by the mandates of the Versailles Treaty, turned to motorless flight not alone as a means of keeping up flying skill and training for future flyers, but as a laboratory for further development of aircraft. All in all, German sailplane designers made upward





Bowlus Baby Albatross, a very popular design in middle 30's, was available in prefabricated kit form for less than \$500. Dural tail boom.

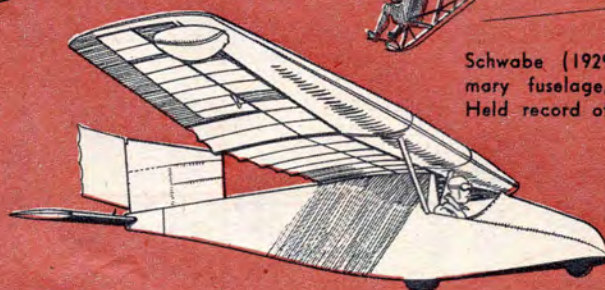
Espenlaub (Germany, 1922), early high-aspect-ratio type sailplane, set pattern for future craft.



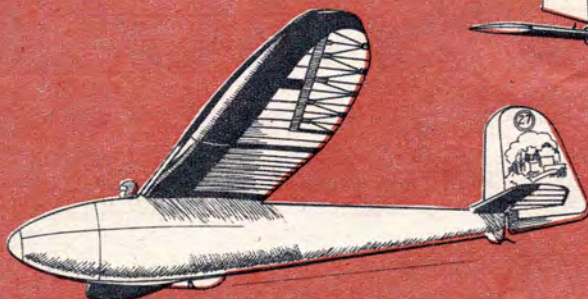
Schwabe (1929), Germany. Primary fuselage, sailplane wings. Held record of 14 hrs. 43 mins.



R. R. G. Storch flying wing glider by Germany's famous aerodynamicist, A. Lippisch.



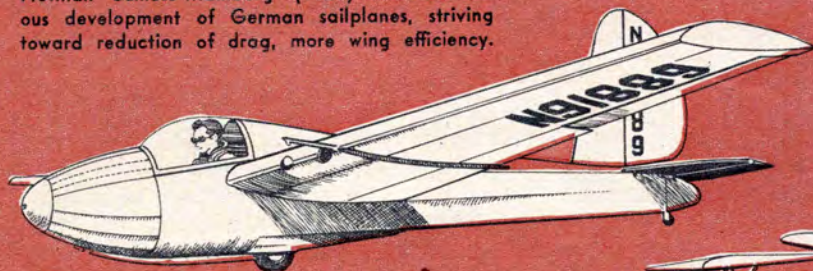
Hanover Vampyr, of same vintage as Espenlaub E.3. Held number of records in Germany.



Hofman "Schloss Mainberg" (1929) shows continuous development of German sailplanes, striving toward reduction of drag, more wing efficiency.



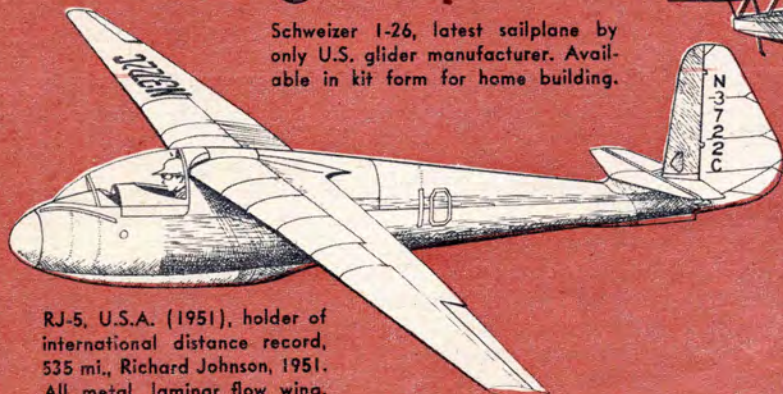
Heidelberg Kurpfalz Saazahn (1923), Germany. One of few examples of biplane gliders. Long nose moment proved craft unstable.



Schweizer 1-26, latest sailplane by only U.S. glider manufacturer. Available in kit form for home building.



Aachen Ente designed by W. B. Klemperer in 1922 was a study in canard type.



RJ-5, U.S.A. (1951), holder of international distance record, 535 mi., Richard Johnson, 1951. All metal, laminar flow wing.



Benson gyro-glider, U.S.A. (1954). Novel but hardly new: Nazis used like type for observation from submarines.

of 50 contributions in aircraft design. Other countries followed rapidly in the steps of Germany, though their motorless flight activities, with the exception of Russia, were inclined more toward the sport side of soaring. The U.S.A., which at first lagged behind other countries (and still has a very small glider movement) surged ahead after World War

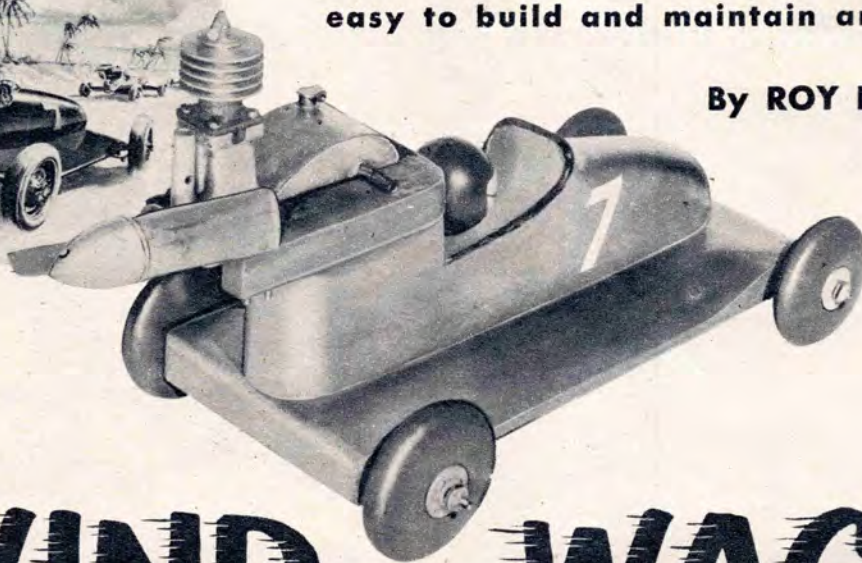
II, in performance. At the present time it holds the world distance record of 535 miles, as well as two world absolute altitude records of 42,100 ft. for single place, and 44,255 ft. for two-place sailplanes. It has also pioneered in the development of the airplane towing method, in all-metal sailplane construction, and use of gliders in aerial research.



## MODEL CAR RACING AT ITS SIMPLEST

Deceptively simple in appearance, every line on this car has been carefully planned to make it easy to build and maintain and fun to race

By ROY L. CLOUGH, JR.



# WIND WAGON

■ Here is the perfect project to absorb your old three-port .19-.29 engine that still has a few kicks left in it despite being outmoded for flying use by newer and hotter engines.

We wanted to find out if a really good air-drive car could be built to look like a real race car and not a runaway fuselage. The results were surprisingly good. With an old O&R sideport .19 it hit a zooming 62.8 mph. Even a beaten-up .14 diesel engine kicked it up to 40 mph. This compares very favorably with wheel-drive cars, and *Wind Wagon* is a lot simpler to operate and cheaper to build.

The plan should be followed fairly closely. Making an air-drive race car is not just a matter of sticking a motor and prop on a wheeled platform; balance and dynamic loadings are important. There are a couple of angles designed into this one which are essential to good performance. For example, the wide under-chassis is not a matter of taste in style, but is made that way to create an airflow pattern to prevent fine abrasive dust, present on concrete surfaces, from being thrown up to the engine intake; the washer arrangement which holds the modelplane type wheels came about because other arrangements wore out aluminum hubs in nothing flat.

Begin construction with the chassis. This is carved from white pine or equivalent. The wheel axles are  $\frac{1}{8}$ " steel landing gear wire. It is not difficult to drill holes in the chassis for these by hand if care is used, but a drill press makes the job a cinch. Don't try to drill all the way through from one side; drill in from each side so the holes meet in the middle. Note how the axles are held by soldered washers. It is not essential that the axles be held so firmly they cannot rotate, but there should be no end-play. Do not put the wheels on yet.

The body is carved from soft pine. Some originality of line is permissible here, but don't depart too far from the plan and be sure the thrust line comes as

shown. The motor mount is  $\frac{1}{2}$ " plywood, cut to fit your particular engine. Chassis, body and mount are assembled with  $1\frac{1}{2}$ " flat head wood screws and a good wood glue—do not use model cement. The cockpit details add realism. The driver is a ping pong ball, painted to look like a helmeted head and the rim of the pit is padded with heavy twine cemented in place. The fuel tank can be anything handy that suits the engine. Several types have been used on the original and all worked well provided the usual U-control fuel feed to the outside was observed. Be sure it is anchored firmly.

Next bore a ballast hole, put in the screw-eyes and bridle and make a trial fit of the engine and tank and check the balance. The model should hang the slightest trifle nose-down when suspended by the bridle, so pour in melted lead or old bearing metal to balance. Pull the engine and tank and finish the model with fuel-proof dope or enamel—incidentally, it seems easier to clock a bright-colored car.

When the paint job suits you install the wheels, using the washer arrangement shown to minimize wear on the hubs. Install the motor and tank and check it over to make sure the wheels spin freely and track and foot well. Put a little #50 oil on the axles every other run and clean them off whenever they seem to be picking up dirt.

Because the engine is pushing instead of pulling you must now check the shaft end play to make sure the push doesn't move the shaft in so far that it puts a strain on the connecting rod or allows the crank throw to strike the back of the crankcase. Usually on such engines as the O&R .19 and .23 sideport jobs the hard steel propeller back plate running against the end of the bronze main bearing is all the thrust bearing required. If, however, there is considerable end play, or gap, fill this in with thin brass or surface ground steel shim washers until the play is just perceptible. Do not run the shaft tight and be sure to oil the shims



well before the first run—seepage will take care of lubrication after that.

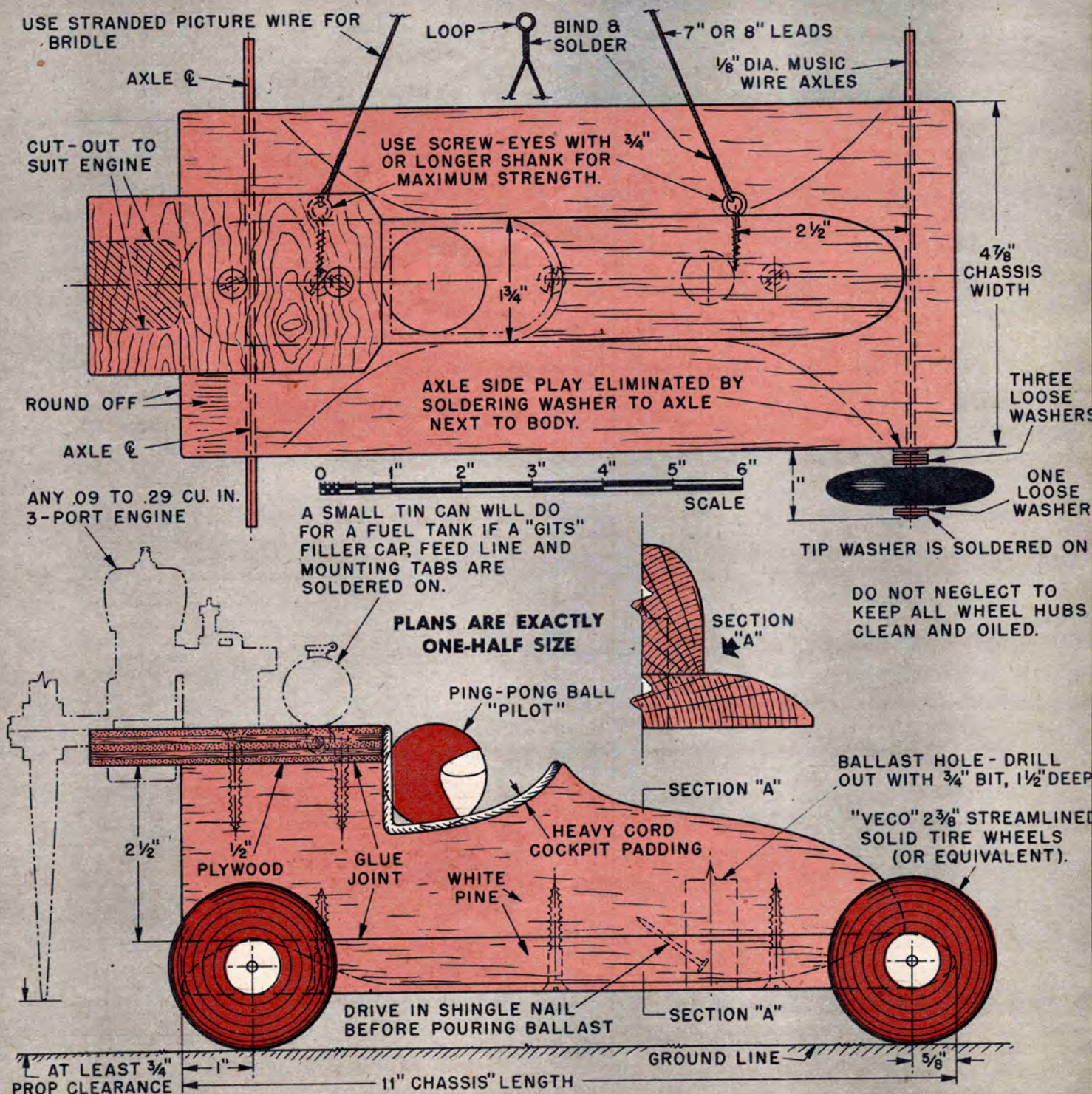
We found that maximum speeds came from careful selection of propellers and by setting the car off a bit rich so that it would start to lean out by about the tenth lap—presumably because the rich start prevented the pusher engine from overheating before the car got going fast enough for the slipstream to provide sufficient cooling.

While this vehicle will never set the world on fire from either the appearance or performance standpoint, it does bring auto racing within the reach of the average miniature engine owner who may not have access to a lathe or the other specialized equipment so vital to AMRCA followers.

By limiting a group of racing enthusiasts to same

size or maximum powerplants any hobby shop or model club can come up with a fleet of cars in jigtime for some informal, strictly-for-fun racing. Almost any smoothly surfaced parking lot will suffice (school yards frequently provide the type of running surface most desirable). A portable center post sandbagged in place and mounting a skate wheel well bolted to a sturdy timber or piece of piping is about all that's needed for "Sunday" drivers. A steel wire connects from the pivoting center piece to the car bridle; be super sure that your lines are all of sufficient size and free of nicks.

As with all projects presented in this publication, the editors welcome your comments and photos of completed models. Let your fellow hobby fans see your handiwork; send along your model pictures.





# Last Steam to Ojai



**With the steam locomotive going out of service, California railroad fan club takes every opportunity to record the passing of its glory.**



Through the picturesque countryside of Southern California, one of the two trains, loaded with railroad fans, speeds to its destination.

Railway Club of Southern California manager John M. Ferris and traffic manager Stan Kistler shoulder responsibilities for these junkets.

■ Railroad fan clubs number in the hundreds throughout the United States. The main joy in life for their members is the shrill call of a steam whistle and the billow of black smoke from the stack of a steam locomotive.

To this transportation hobby, the Railway Club of Southern California adds a second hobby. Virtually all the 450 members of this club carry cameras on their trips. From box camera to Speed Graphic to Bell and Howell, members of this Los Angeles rail-fan club make film records of their railroad travels.

Typical of a one-day trip of the Railway Club of Southern California was the tour taken recently by two six-car trains, each pulled by a steam locomotive, to the little town of Ojai, 90 miles northwest of Los Angeles. This Sunday junket was the last of the steam locomotive trips into this isolated town. Railroad water service had to be overhauled at two points in advance to ac-

Club members are ardent shutter-bugs. Keeping a pictorial record of their trips is an important adjunct to their activities.





commodate the two trains. A diesel freight train makes the 20-mile run from Ventura to Ojai twice each week, but this was the final run for steam engines.

The two 2-8-0 "Consolidated type" steam engines came out of retirement for this safari.

At least two camera stops are planned on each trip. After the train is halted, passengers get off and pick photo vantage points while the train backs up out of sight. Then the fireman applies enough oil to "black stack" billowing clouds of smoke, steam whistles scream and the train passes by in all its fading glory. Later a photo competition may be held among club members.

Manager of "the most traveled camera club in the world" is Pullman Conductor John M. Ferris of Los Angeles. He takes time off from his regular trans-continental Pullman runs to arrange and conduct these photo rail fan trips. The club is a non-profit organization and charges on trips are determined in advance by the various railroads furnishing equipment for the trip. The rail fan club handles all advance publicity among its members, sets up schedules and prints tickets.

Steam engines are utilized whenever possible, but the club has also traveled by diesel train, boat and bus. "If you're going to ride trains, you're going to use diesel," says Mr. Ferris. Railroad records show that not a single steam locomotive was ordered by a domestic railroad last year, though some were built for export.

Rail fans with this Southern California club extend their travels from one-day junkets to ten-day summer vacations. Transportation costs on these long trips will average out at \$80 for rail fare from Los Angeles to Central Oregon or the Rio Grande River. Out-of-the-way industrial railroads are visited on these trips and Pullman cars are used for lodging where necessary.

With the ever-increasing use of diesel power, the future of the steam locomotive appears in doubt. However, rail fan clubs, railroad historical societies, old-time railroaders and a new generation of young men and women with a hobby of steam railroading are aiding in the preservation of the colorful "iron horse."

A typical stop to give fans a chance to shoot pictures was at the Piru Creek bridge. To add dramatic effect, fireman "black stacked" and blew the whistle, producing clouds of smoke and steam.



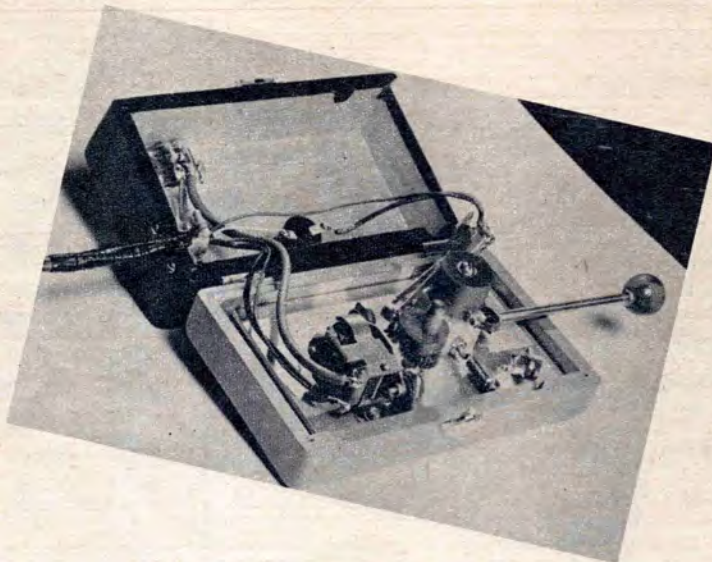
A Consolidated 2-8-0 locomotive, taken out of mothballs especially for the occasion, streaks through California orange grove on its way to Ojai. Southern Pacific RR cooperated in arranging for the trip.



Railroading and photography make two hobbies for Bob Kubach, in process of snapping the Consolidated 2-8-0 locomotive. Front of his engineer's cap has Railway Club of So. California's insignia.







**Latest pulse box has many unusual features that set it quite apart from the usual run of "coffee grinders"**

**By HOWARD G. McENTEE, W2SI**

mitter to 50 mc., it seemed a good time to make a new pulse box, with a motor that would be absolutely reliable on the 2 V. storage cell. The result is shown here, and has proven most satisfactory.

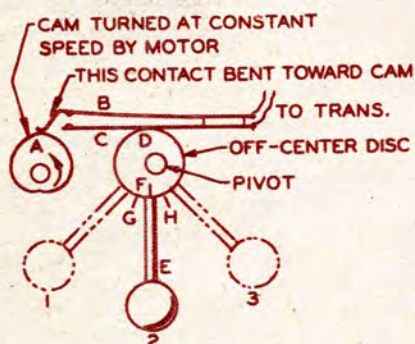
While it is rather doubtful that exact copies of this unit will be built, we give general details for the guidance of those who like to build "by the numbers." Some of the ideas presented may be adapted to other designs, of course. The motor operates a cam through a single worm and gear, the cam turning at about 500 rpm in this unit when fed the full voltage from the 2 V. cell. Fig. 1 shows the basic principles involved; cam A is rotated by a motor (not shown) at constant speed. B is bent so that it always tends to follow the contour of A, except

to position 1 would raise C, so that B and C would be in contact all of the time, and you would get a steady signal. This gives one rudder extreme in the model. With the arm at position 3, C drops downward until contact B does not hit it at all; this gives no signal, the other rudder extreme. Any position between 1 and 3 will give a different proportion of on-to-off signal, and the actuator in the plane will take up a corresponding position.

If you take the arrangement shown in Fig. 1, and add a few "frills," you have the pulser shown in the photos. The cam A will be seen to have a peculiar heart-shaped contour; made this way, you get smoother control over the whole range of on-to-off signal. Actually, a simple disc with an off-center hole, used at A, will give quite good results, but the special cam is worth the extra labor needed to hack it out.

The layout of parts is not critical, of course, but things must be placed so that the correct contact action, as shown in Fig. 1, is had, and so that everything will fit in the chosen box. In our case, said box was cut down from a standard file card box, a wooden job labelled 3 x 5 x

FIG.1 BASIC MECHANICAL PULSER



its reliability; provided you fit a good motor, this sort will grind away tirelessly, requiring only a little low voltage to make it tick. It is a more versatile type, too, since it is very easy to shift the neutral setting (that is, to change the center rudder position) while still retaining the same overall control range.

We have used a mechanical box for years, with such reliable results that we would hate to use any other sort; this one worked on 6 volts, though, and when we recently changed over the Mac-II trans-

A detailed cross-sectional diagram of the motor frame assembly. The diagram shows a vertical motor frame being mounted onto a horizontal base plate. A mounting bracket, labeled 'MOUNTING BRACKET - I', is positioned between the motor frame and the base plate. The bracket is secured to the motor frame by a '2-56 SCREW AND NUT'. A 'GROMMET' and a 'LARGE WASHER' are placed between the motor frame and the bracket. A 'BUSHING' is located between the bracket and the base plate. The base plate is shown with a series of mounting holes. A dimension line on the left indicates a distance of '1 1/2' from the top of the motor frame to the top of the base plate.

MOTOR FRAME

GROMMET

LARGE WASHER

2-56 SCREW AND NUT

BUSHING

MOUNTING BRACKET - I

BASE PLATE

1 1/2

FIG. 2 MOTOR ANTI-VIBRATION MOUNTING

when prevented from doing so by C. The latter is controlled by cam D, which is rotated through part of a revolution by control stick E. As we show things, E is in the central position (2), which would give neutral or center rudder. Moving E

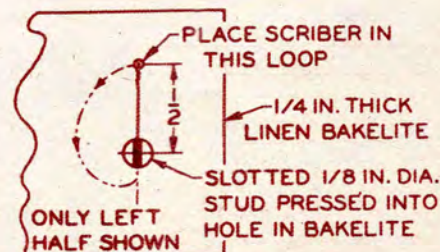
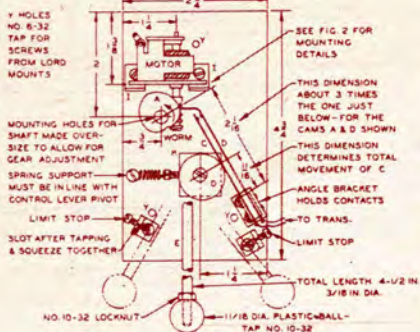


FIG. 3 MARKING CAM A

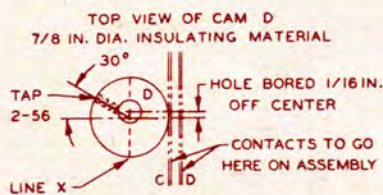
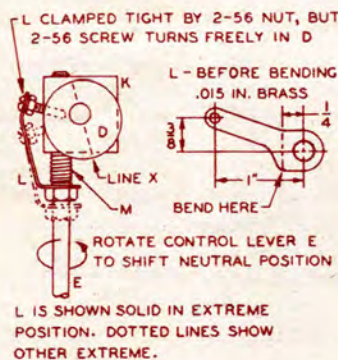
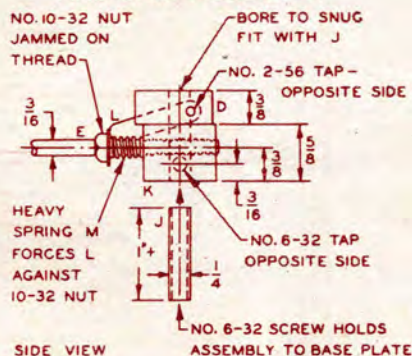


Y HOLES  
NO. 8-32  
TAP FOR  
SCREWS  
FROM LORD  
MOUNTS



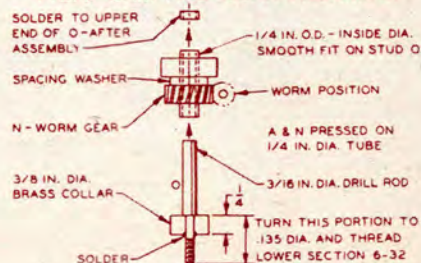
The majority of mechanical pulsers are pretty noisy—in fact, as a class, they are often called “coffee grinders”! We decided to quiet this one as much as practical, which meant that the motor had to be rubber mounted. This was easily done. The motor mount brackets, I,

FIG.5 CONTROL LEVER  
AND CAM ASSEMBLY

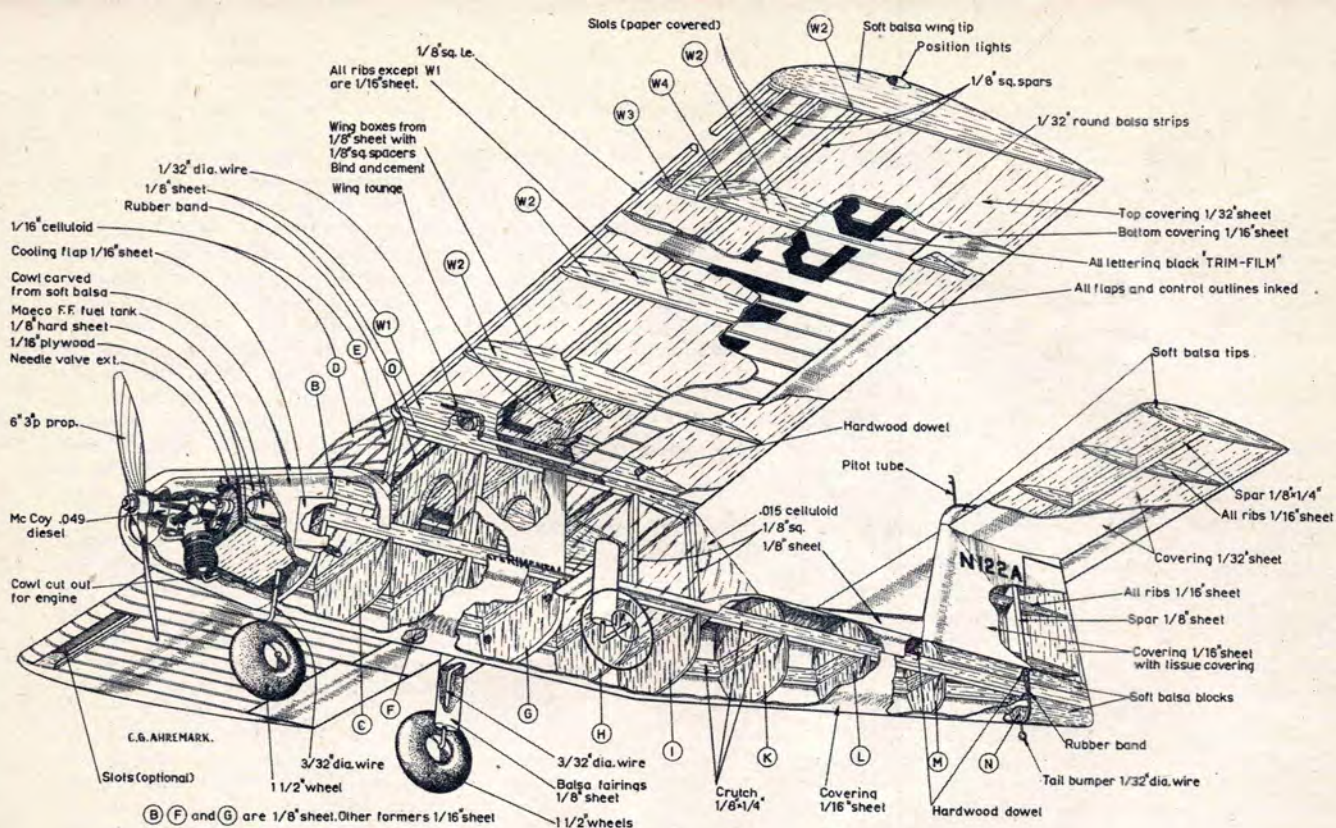


well under control, but gear noise is still transmitted to the base plate and out through the box. Therefore, the entire working mechanism is mounted on three Lord mounts; these are the flat type and rated at 3 lb. load. Two of them are at the end of the base near the control lever, and one is under the motor end. The final effect is most gratifying; instead of a grinding roar, just a very quiet hum comes from the pulser. Actually, most of the noise you hear escapes through the slot where the control stick emerges from the box. Now if we can just figure a good way to seal off this slot . . . !

We have not given exact dimensions of every part, since other builders will want to use what parts they have on hand, and they will (Continued on page 60)







# Model the Fletcher FL-23

■ The Fletcher FL-23 was designed and built to meet the requirements of a U. S. Army Ground Forces specifications for a light liaison aircraft. The plane was completed in March 1950 and entered in the competition for the \$5 million production contract. Other airplanes entered were merely modifications of standard commercial models and at this point the Fletcher FL-23 seemed a certain winner. However, during one of its early flight tests the stabilizer was carried away, the two test pilots bailed out, and the airplane was seriously damaged in the mishap. Despite great haste

Fletcher was unable to repair the plane in time, and it was eliminated from the competition (Cessna was declared winner and awarded the contract; Cessna's airplane designated L-19 "Bird Dog" was featured in AT for October as a A/2 flying scale by Aubrey Kochman).

The FL-23 was an all-metal airplane with fixed tricycle landing gear powered by a 235 hp Continental. It had a span of 33 ft., 4 in. and a length of 28 ft., 4 in. With a crew of two, the plane had a maximum speed of 133 mph and a stalling speed with flaps



Only deviations from scale are in dihedral and transparent section of fuselage which was molded in one piece on prototype.



Designer-modeler-draftsman Ahremark proves with this FL-23 he is a man of many talents. He also made the splendid cutaway drawing.



## Remarkable craft when scaled down makes a perfect "Half-A" free flight design; you can utilize any powerplant in the .049 cubic inch range

of only 38 mph. The airplane had a special stabilizer-elevator combination developed to insure perfect control. The stabilizer was hinged at the rear spar and so linked that when the stabilizer moved down the elevator also moved down and vice versa.

The model is scaled  $\frac{7}{8}$ " to the foot and the only deviation from scale lies in the dihedral and the "greenhouse" which on the original is a one piece formed plastic enclosure. The airfoil, NACA 4412, is retained with a flat bottom. My FL-23 weighed in at 10 oz. ready to fly.

Construction begins with the fuselage. The crutch is laid out directly over the plan top view. Add all crosspieces and while things are drying cut out the formers. Don't forget to drill former G for the 1 g. mounting bolts. Crack the crutch at I and place a  $\frac{13}{16}$ " block under the tail end. Cut out  $\frac{1}{8}$ " gussets and cement in place at the crack with plenty of cement to insure a strong joint. Add top halves of formers B, F and G. Use templates as shown in detail drawing A to get proper angles for these formers. Cut out rib O, score and bend at H and cement in place. Add  $\frac{1}{8}$ " sq. pieces and celluloid formers at D, E, H, and I. Inset hardwood dowel at H and cement top halves of formers K, L and M. The wing tongue

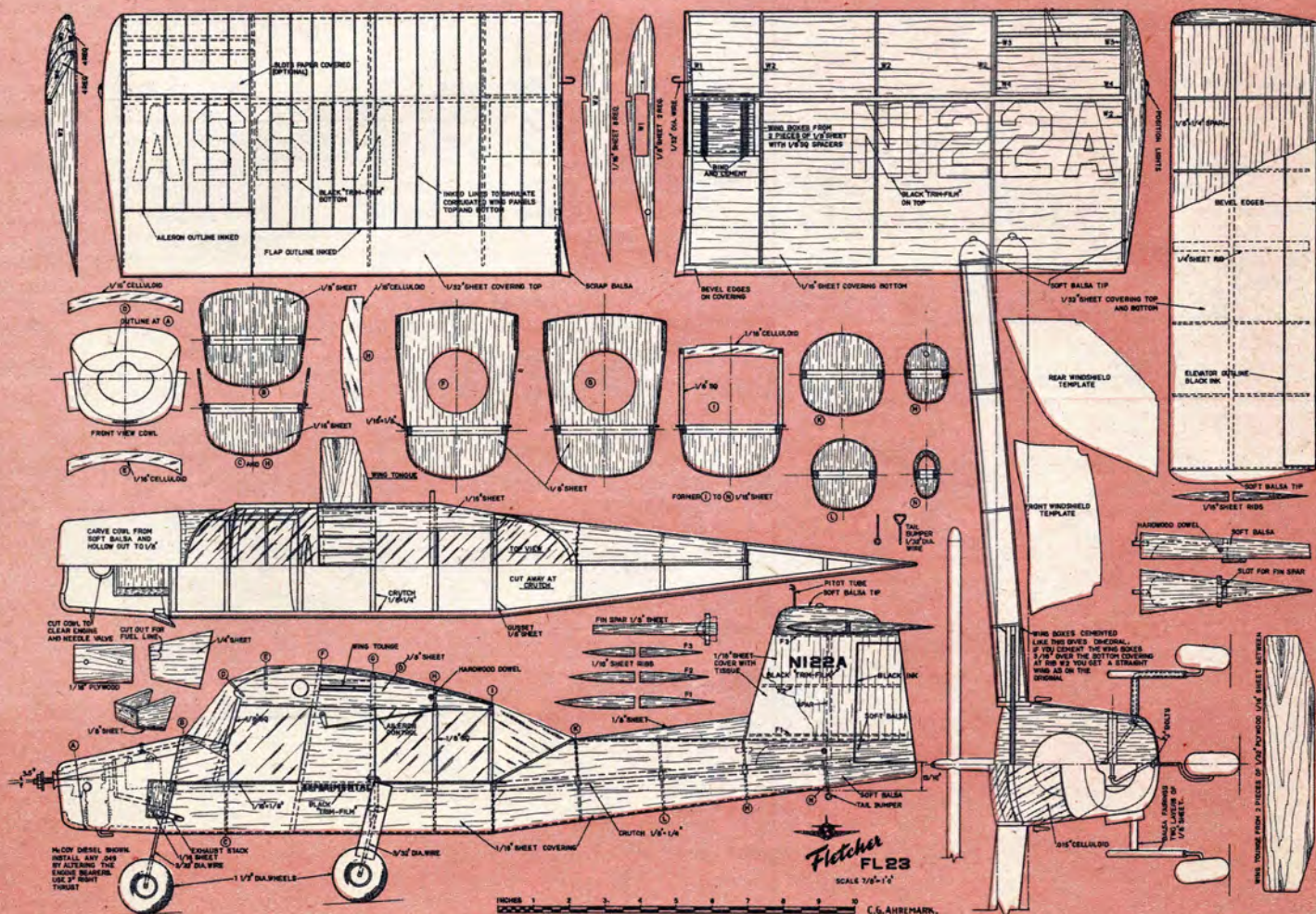
is cut from  $\frac{1}{32}$ " plywood and  $\frac{1}{16}$ " sheet, the  $\frac{1}{16}$ " sheet cemented between two plywood pieces. When dry, the wing tongue is inserted through the cut-outs in O, and firmly cemented in place with scrap balsa gussets against F, G and O.

With the top portion of the fuselage nearly completed, next tackle the bottom section and the landing gear. Cement all bottom halves of formers in place, checking that former B gets correct angle. Cement  $\frac{1}{8}$ " gussets at former I to strengthen the crutch joint. Bend landing gears from  $\frac{3}{32}$ " dia. wire as shown in the front view, then bolt them in place with "J" bolts. Then the fuselage is ready for covering with  $\frac{1}{16}$ "

Full-size plans for the FL-23 are on Group Plan 1054 from Hobby Helpers, 770 Hunts Point Avenue, New York 59, N. Y. (50¢).



By CARL G. AHREMARK







## Fletcher FL-23

sheet. This is quite simple because there are no double bends involved. Measure the circumference of the first and last formers to be covered and cut the sheet to this width, apply a thin coat of cement to the inside and wet the outside with water. When the sheet has right amount of curl to fit the fuselage, cement it in place. The covering above crutch, between formers F and G, needs no cement or water. Bend tail bumper from 1/32" dia. wire and cement in place with the soft balsa block against former N. Cover with 1/16" sheet between G and I as shown in top view.

The engine bearer is built up as shown in detail on plan; drill holes in the plywood to suit your engine. Cut out for the nose wheel landing gear and cement to former B. Build up the cowl and carve to shape. The top portion is spot cemented in place to be removable. Hollow out to thickness shown on plan and cut out to clear cylinder and needle valve and also the exhaust exits on both sides. Cement the bottom cowl in place and add the cooling flaps of 1/16" sheet. Glue two small nuts on top of the engine bearer and drill two corresponding holes in the top portion of cowl. This is held in place by small screws passing through the cowl and into the nuts. Next the main landing gear is covered with fairings of 1/8" sheet carved to streamline shape.

The wing is of very simple construction and should not present any difficulties. Start cutting out all ribs and sandpaper them pinned together as a unit. Mark W1 very carefully for wing tongue and cut out. Then

drill for hardwood dowel. Cut out for the two slots spars in four of the W2 ribs and cement the W3 and W4 in place on these. Cement the wing boxes together and bind with thread, place W1 against O and push the wing box on the wing tongue and into the cutout in W1 and cement securely. This is to insure a tight fit between wing panels and fuselage. Since the wing chord is 7 1/4" you must join two 1/16" sheets for the bottom covering.

Cut the sheet to outline shape excluding the tips and use the cement and water method to curl 3/4" at the leading edge. Mark the location of ribs on the sheet, cement the slot spars in place, then cement all W2 ribs to the sheet and add spar and leading edge. The W1 with wing box is then cemented to wing panel; if you want a wing with dihedral, you cement the wing box against the bottom covering at the rib W1; for a straight wing as the original you have to first cement a length of 3-16" sq. between the wing box and bottom covering. A 1/32" dia. wire hook is pushed through the W1 exactly opposite the round hole in O and cemented liberally on the inside. Cut out the slots in the bottom covering and sand well in the opening. The top of the wing is first covered from W1 out to the slots, then the portion from slots to trailing edge. After that you cover the slots with stiff cardboard paper, being careful to get it flush with the top covering. Then cover with sheet from l.e. to slots and sand leading edge and trailing edge to proper airfoil shape. Add the wing tips and the triangular fill-in between wing and fuselage.

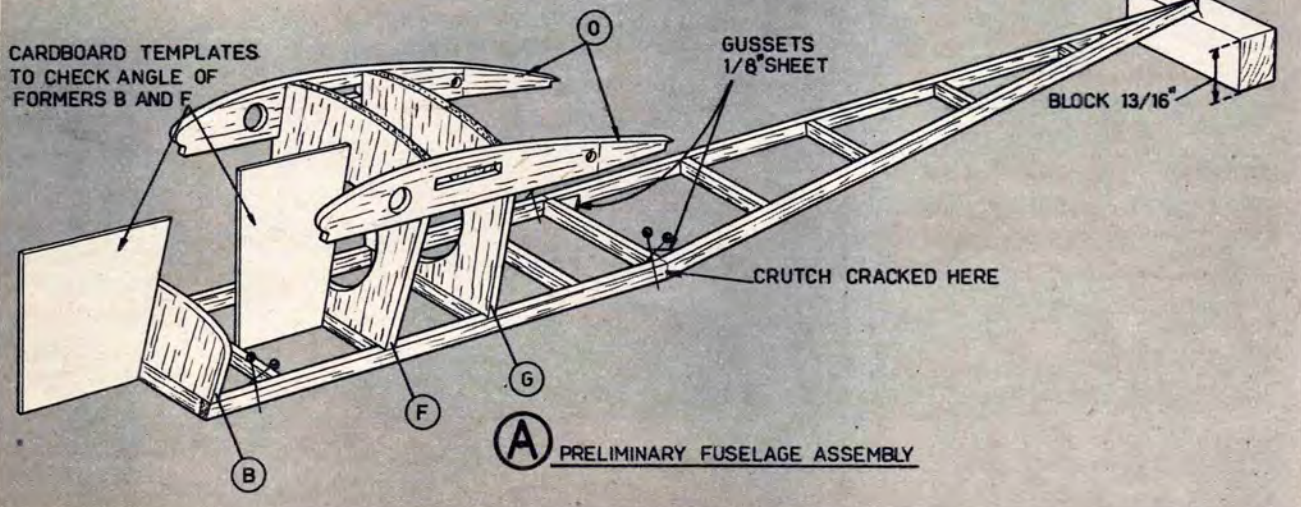
The tail surfaces are removable but the dorsal fin is cemented to the fuselage. The construction of the stabilizer follows mostly that of the wing. Cut the top and bottom sheets to outline shape. Cement all ribs to the 1/8" spar. When dry, cement the top and bottom sheeting in place and add the soft balsa tips.

The fin must be carefully constructed to be as strong as possible. Begin with the soft balsa block that acts as base for the fin, the final forming being done in place on the fuselage to get a good fit against crutch and former M. Add the hardwood dowels and the small 1/8" sheet piece that holds it in place in the crutch. Cement the spar in the slot and add the ribs, then cover both sides with 1/16" sheet. Sight along the fuselage and eliminate any warp before the cement has dried. Shape the (Continued on page 61)



Fuselage is built around conventional crutch, blocked up at rear to provide upswept tail. Proper alignment of formers is a "must."

CARDBOARD TEMPLATES  
TO CHECK ANGLE OF  
FORMERS B AND F

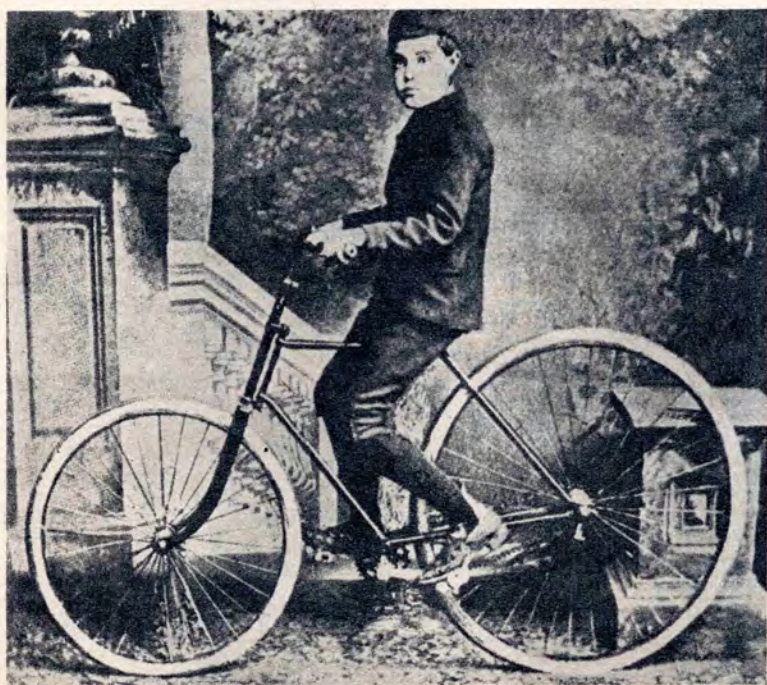




## BIOGRAPHY OF THE BIKE



The "High Wheeler" was originally built of wood, had iron tires. It rightfully earned nickname of "boneshaker." Introduced in 1866 (above), it was later improved by sewing machine firm that added solid rubber tires, wire spokes.



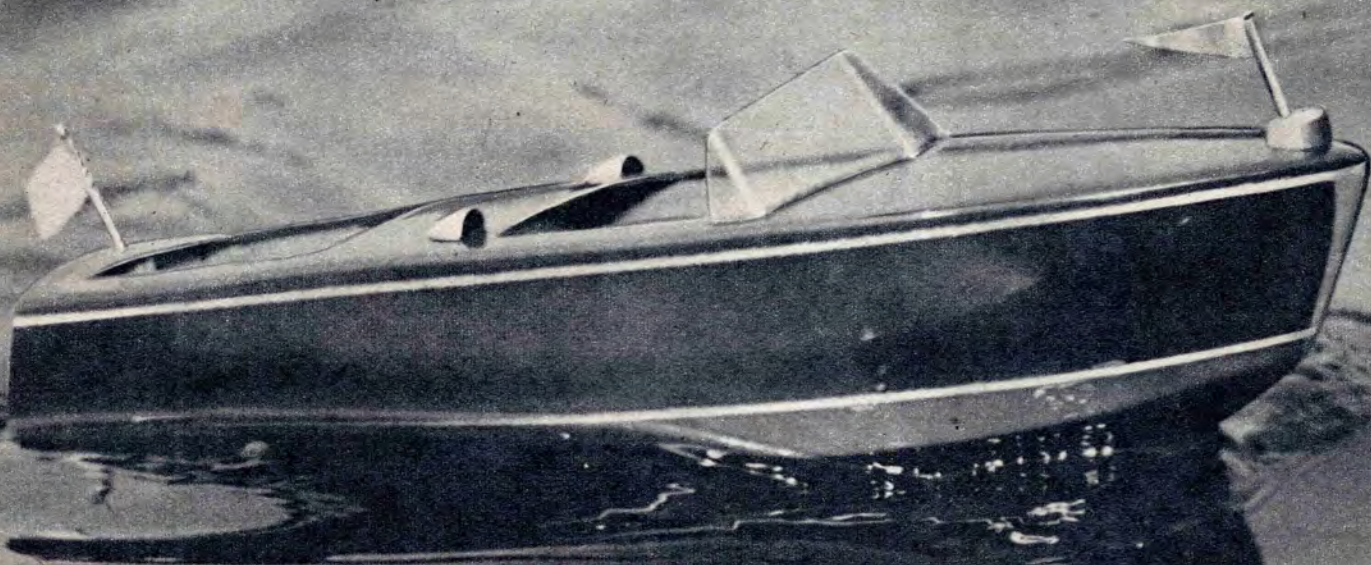
Baron von Drais of Germany, astride the Draisine built by him in 1817. This was actually an improvement of Frenchman de Sivrac's machine constructed in 1690 to which von Drais added a steering mechanism, but like the prototype it had no pedals.



In 1865, J. K. Starkey of England came out with a bicycle whose front wheel was a shade larger than rear one. This type had considerably more speed than the old high wheelers, was more comfortable (despite hard-rubber tires). Daddy of today's bike.

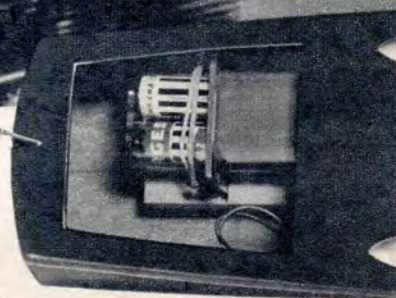
An Irishman by the name of John B. Dunlop made an important contribution to travel in 1888 by inventing the pneumatic tire. As a result bicycling rapidly became one of most popular outdoor sports. Shown here is his son riding first bike with "inflatables."





## **ECONOMO** *ELECTRIC RUNABOUT*

**Even though she looks like the real thing, this water speedster is just a model—but still a most unusual one. Construction follows our ultra-simple Dolphin. Power-plant is quite unusual . . . draws only 30 milliamps.**



■ Nope, this isn't the latest in motor cars, but an extremely economical electrically driven model boat. Power comes from four flashlight pencils hooked in series, and the life they will give is nothing short of astounding—especially if you have run electric boats before. This project all started when a very remarkable electric motor was brought to light, and it seemed worthwhile to make a little boat to try it out.

The motor, first described in the last issue of "ATH," was "pirated" from a German import, a scale Porsche automobile, called the Distler Electro-Matic 7500, sold by the F. A. O. Schwarz toy people in New York City for \$5. The manufacturer is Johann Distler, 5-9 Dammstrasse, Nuernberg, Germany. The electric motor is described by Distler as "an entirely new miniature motor of astounding power, with twin ball bearings. This motor . . . has been tested to run more than 500 hours without interruption in neutral (no load) with a normal 4.5 volt battery."

To keep the boat light and simple, all-sheet balsa construction was used. We followed somewhat the ideas employed in the Dolphin boat, shown in April, 1954 "ATH," but made this one an open runabout design. All you need are three sheets of 3" wide 1/16" rather soft balsa. Cut out paper patterns for the four bulkheads E, F, G and H, the floor A, keel B, stem D and the entire deck I. First job is to bend up the forward end of A; moisten it well with water, lay it on a firm surface, and roll a hexagonal pencil *hard* over the upper surface, from the position of F forward. This will leave a series of faint lines impressed in the wood, and will make it possible to bend it as seen in the side view. Hold it with blocks and weights till it dries.

Turn A bottom side up and cement B to it; cut the notch for the prop shaft in both pieces before they are fastened

together. Triangular sub-formers are cemented on the underside of A, at the location of each main former. Then comes the hull bottom C, made of two pieces that run the full length of A, and butt together at the center of B. There is considerable curve in the forward ends of these C pieces, so moisten them, roll a pencil heavily over the *upper* side, and form them carefully with your fingers, before you attempt to attach them.

With A, B and C fastened together, and the edges trimmed smooth, block the assembly on your bench right side up, and attach D, E, F, G and H. Note that the grain of the latter runs vertically, since it has to be bent to a moderate curve. The deck is in two halves, which run the full length of the craft, and are cemented together along the centerline. Grain is fore and aft, of course. The foredeck, center deck and aft deck should be moistened and formed to the curvature of the bulkhead upper surfaces, before the deck is attached.

Before the hull sides are installed, sand the edges of C, I and all the bulkheads, so the sides can go on smoothly and without bumps or hollows. Sides can be cut considerably oversize, as they may be trimmed to fit after they have been cemented in place. The sides should also be moistened, and the forward third given the hex pencil treatment. Be certain the sides are bent to the proper shape, then cement them in place.

The 1/16" I.D. tube for the prop shaft may now be cemented

Full-size planes for the Economo are part of Group Plan 1054 from Hobby Helpers, 770 Hunts Point Avenue, New York 59, N. Y. (50¢)



in place, along with the tube of same size for the rudder support. Scrape both with a rough file before you apply cement—the latter can then get a decent “grip” on the smooth brass surface. Attach the keel J to the bottom of the hull, after cutting it away to clear the prop shaft.

Sand the entire hull smooth, round off the sheer edges, and stuff up any gaps with filler. Then give the entire hull three coats of balsa sealer, sanding lightly after each coat. Many boat builders leave the cockpits unfinished, but this is an invitation to disaster. It is suggested that the same filler treatment be given the *inside* of the boat; then if you ship a bit of water, or the boat founders, it won't soak up water like a sponge.

Finish coats of dope may now be applied. The boat shown was given three coats of a “mahogany” mixture, made from red with a small amount of black added. Three coats of red went on below the waterline. A few such details as bow light, masts with flags, plastic windshield and vents over the “engine compartment” dress up the craft.

Distler's special electric motor drives the prop through a gear reduction system—one of the reasons why the boat will run so long on a set of batteries. The step-down ratio is about  $3\frac{1}{2}$ -1. The motor, as it is removed from the toy auto, already has a gear on its shaft. This meshes with the largest gear taken from the “transmission” of the same toy auto. The large gear fits perfectly on a  $1/16$ " dia. length of music wire, which is the actual prop shaft.

A 1" dia. Sterling Nylon prop is used; it has a hole larger than the shaft, so a  $1/4$ " length of the  $1/16$ " tubing is soldered to the lower end. The hole in the prop is then drilled out till it is a tight press fit on the added length of tubing. Slide the prop and shaft into place, and solder the large gear at the

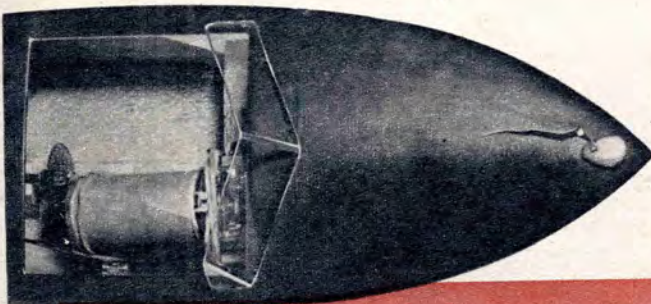


Looking for all the world like a full-size runabout, little Economo scoots across the water leaving a very realistic wake a-trailing.

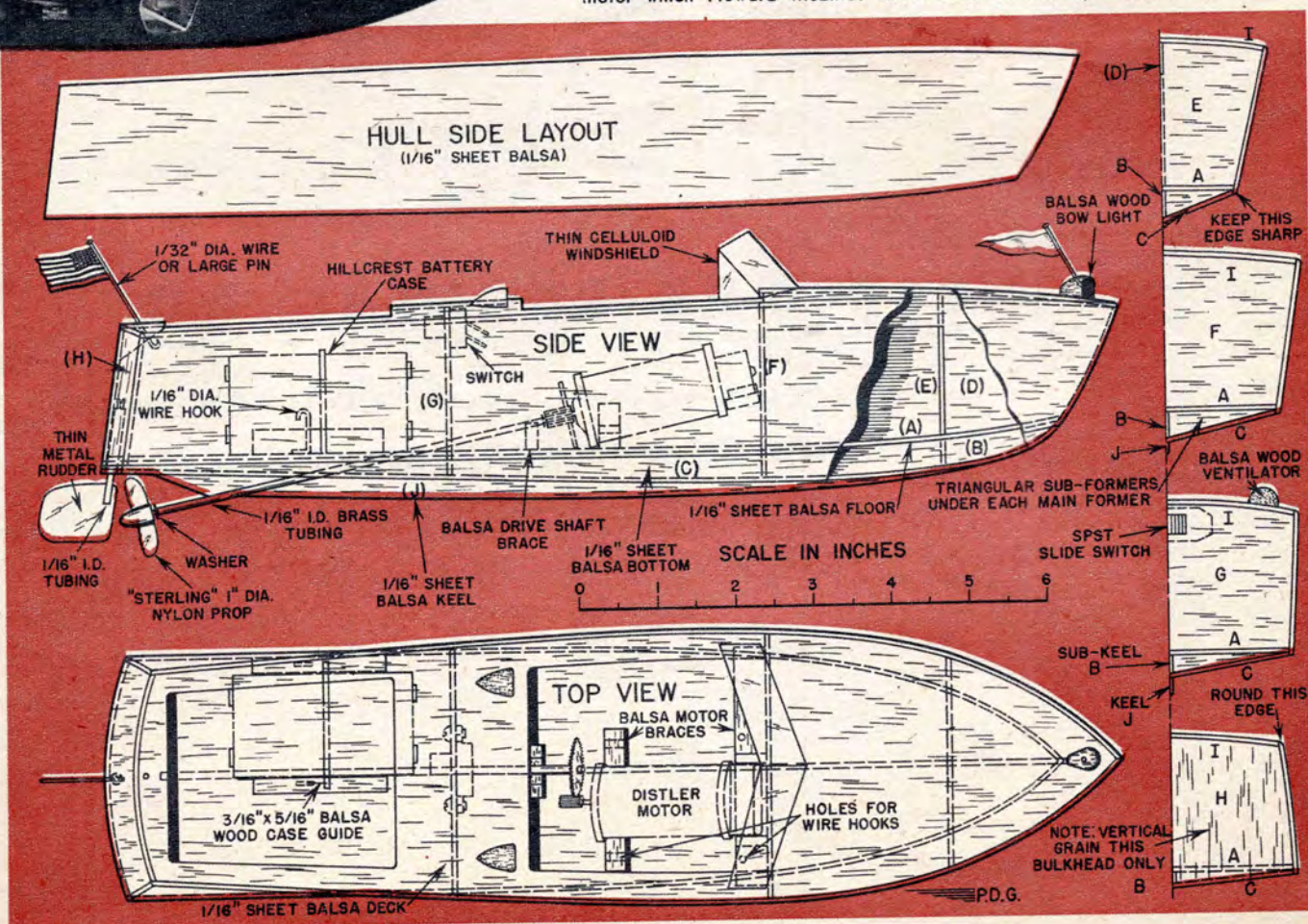
upper end. Motor is held by two pine pieces, K and L. The former is cemented in first. Both K and L have two holes drilled in them for copper wire hooks; the motor is held in place with rubber bands over these hooks. To install the motor, fasten L to it with a band, and set the motor in place after having smeared the bottom of L with cement. Move the motor carefully sideways till the gears mesh nicely; there should be a *little* play between the teeth. Pieces M are then cemented to K, to keep the motor forward end firmly located.

Attach the switch to bulkhead G, then install the battery holder. Since the motor is off to one side, the batteries have to be on the other side of the boat to balance. If your boat has been completely painted at this point, you can float it and check the exact location of the batteries. The holder is held in

(Continued on page 72)



Shown clearly at left is the amazing low-drain German electric motor which Howard McEntee covered in his last R/C column.







# DOPES...

*for model*



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## Bobby Benson's B-BAR-B Building Project Texas Ranch House Model

This is the fourth in a series of Texas-type ranch buildings which have been presented in model plan form. First came Bobby Benson's B-Bar-B Bunkhouse, then the B-Bar-B Heliport Hangar, then the B-Bar-B Ranch Barn. This ranch house, like the previous structures, can be made from cardboard or balsa wood or a combination of the two materials. Exact dimensions for each side, section or top piece are shown, so no full-size plans are required. On the original miniature ranch house, a number of small dowels were cemented in place to make an authentic-looking roof.

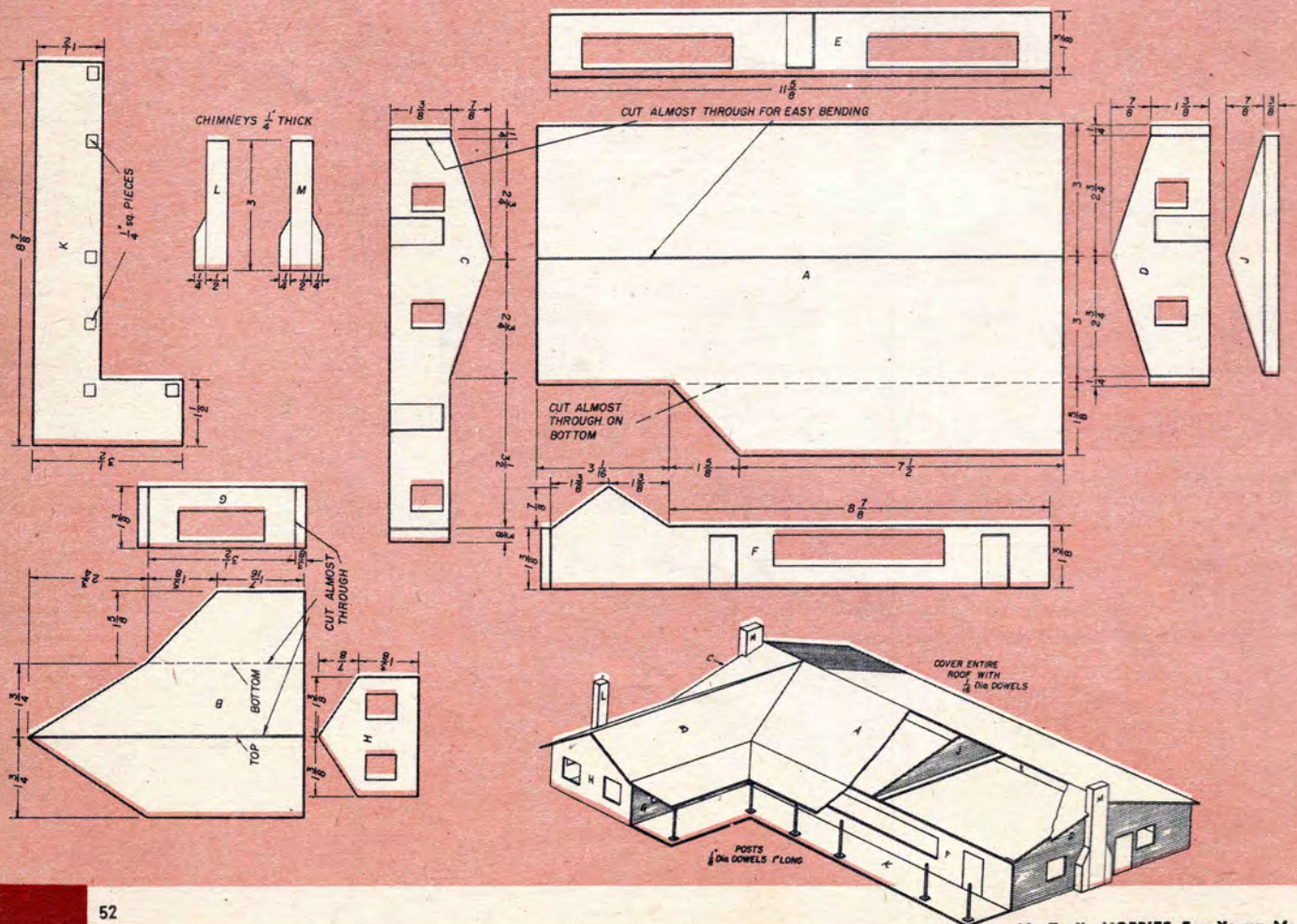
With the completion of this building you will have in model form a fairly complete, modern ranch which can be used for many different types of displays. If there is a Mutual Broadcasting System radio station in your community or vicinity, by all means advise the station manager of your completed B-Bar-B ranch (in miniature, that is!) since it is entirely possible that the radio station would want to arrange for a public display of your models.

Other good locations for display of model ranch buildings would be your hobby shop, school or library—the latter in conjunction with a display of Western books.

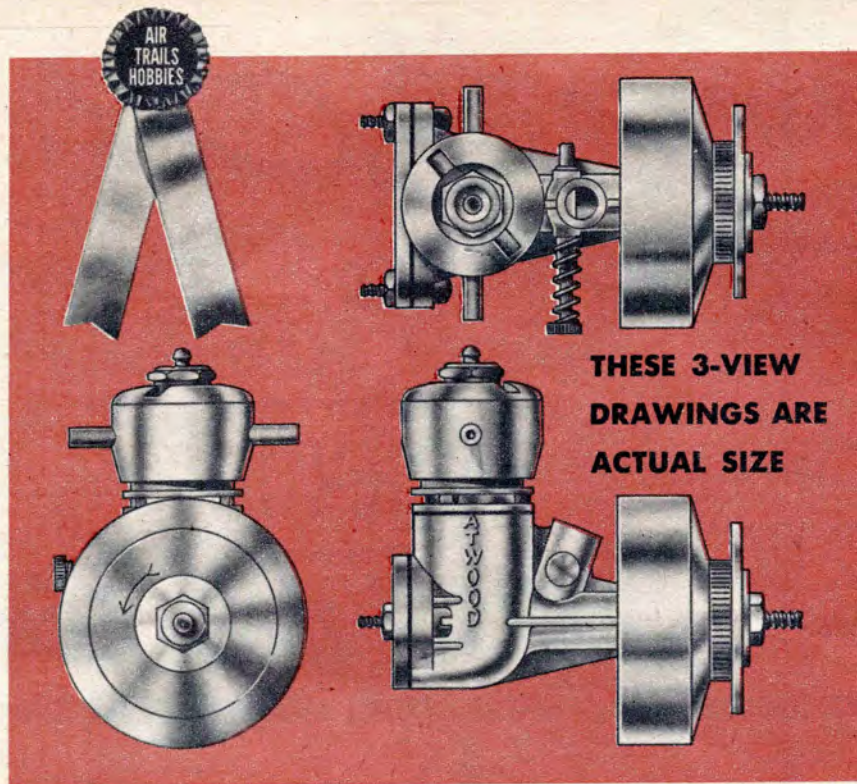


Bobby Benson and his B-Bar-B Riders broadcast coast to coast over the facilities of the Mutual Broadcasting System three times each week. See local listings for time and station. Follow young Benson, his foreman Tex and Windy Wales on their adventures over your local MBS radio station.

**TOP WINNER** in the Bobby Benson B-Bar-B Heliport Hangar model building-photo contest was Donald Coleman, of Kenmore, N. Y. Runners-up for valuable awards included Ernest Blake of Colorado Springs, Colo. (2nd); Joe Komarmy of Bakersfield, Calif. (3rd); Arthur Krisinski of Jersey City, N. J. (4th); and David Nichols of Cascade, N. H. (5th). The "ATH" awards were as follows: First prize, \$100. Second prize, \$50. Next 4 places: Eveready battery-equipped Readyflash Camera outfits with flash units, films, case and bulbs. Next 40 places: Eveready pen-type flashlights.







# Atwood's Inboard Boat Engine is First Water-Cooled Half-A

■ Overheating problems, one of the bug-a-boos when converting air-cooled engines to marine use, have been tackled "head on" in the Half-A class. The Atwood water-cooled inboard is the answer to the model boat builder's prayer. It is a true marine engine water cooled where it counts most—at the cylinder head.

An aluminum turning forms the water jacket. It fits down over the finless cylinder and is held in place by a new and cleverly designed head. The head is also an aluminum turning. It has the two-fold purpose of being head and inner wall of water jacket. By threading to the steel cylinder the head thus holds the jacket in place. Two brass tubes fitted to the water jacket 180° to each other form the inlet and outlet pipes for unrestricted and thus efficient water flow.

Two forms of water pick-up tubes have been suggested for use with

these little engines. The more commonly used method is to locate the pick-up tube under water near the front of the hull. The forward motion of the model thereby forces water into the tube and on up to the engine. The only hitch to this method is quite obvious. Cooling of the engine is solely dependent on forward motion. Should the model hit an obstruction and be stopped for any length of time with the engine still running—well, there goes the water cooling and very possibly another good engine burned out by its biggest enemy, overheating.

The second method does not depend upon forward motion and therefore seems to us to be the safer means of getting a steady supply of cool water to the head. The pick-up tube is located behind the propeller. In this position the propeller forces the water up the tube whether the boat is moving or not. As long as the propeller is turning in water, the engine is assured of a steady supply to the water jacket.

All Atwood marine engines come fitted with an anodized aluminum flywheel. It is friction-driven through properly matched tapers on the crankshaft and in the flywheel. Being undercut on the rear surface, it reduces the bearing loads at the extreme end of the crankshaft. The flywheel is deeply grooved and knurled to afford good gripping properties for the starting cord. It is held in place by a threaded extension shaft which passes through it and threads into the hollow crankshaft. A nut holds the flywheel securely in place. Enough of the threaded shaft extends forward of the flywheel to make coupling it to the propeller shaft a simple matter.

Unlike many, the Atwood is pretty

much of a machined engine. The two aluminum castings, the crankcase and back cover are exceptionally clean. The workmanship on the remaining machined parts is above average. The one-piece steel crankshaft is not counterbalanced. This is the one fault we found in the design. However, the engine runs very smoothly, which leads to the belief that the weight of the flywheel nullifies any out-of-balance condition that may exist.

The connecting rod end is machined to form a round ball which fits into a concave or socket machined inside the top of the piston. This method allows the piston to rotate for even wear and also eliminates the need for a wrist pin and pads. The steel piston is slightly domed on top but other than this dome, does not use a baffle. The 360° intake and exhaust porting also makes it unnecessary. The brass needle valve and body have also been given special attention design-wise. This is one engine of a select few wherein the needle valve taper actually seats into the fuel inlet orifice. A small feature perhaps, but nevertheless one that emphasizes to what extent the designers have gone to give you a well designed, dependable engine.

Starting of the Atwood inboard is exceptionally quick. With the proper needle valve setting and a prime directly into the cylinder, through the exhaust ports, one pull was usually sufficient. A round braided shoe lace makes a good starting cord. Three or four turns around the flywheel worked best during the test, but a little experimenting will quickly show what happens to be best for you.

Although it is not recommended that the engine be run for more than 30 seconds out of water, we checked our test engine at 20,000 rpm. Speeds are unusually flexible. Running on a rich needle valve setting showed that this engine is capable of smooth half-speed runs. Needle valve action was positive and no floating was encountered. The inboard mounts radially by the two crankcase back-cover bolts. Direction of rotation is counterclockwise and is clearly indicated by an arrow on the flywheel. A left-hand propeller is therefore required.

## Previous Engine Reviews

K&B .35 Stunt, Sept. 1954 issue; Herkimer .19 Cub, Aug. 1954; Cameron .09 Marine, July 1954; Allyn Sea Fury, June 1954; Herkimer .049 Cub Diesel, May 1954; Veco "29" and "31," May 1954; Fox .19, April 1954; Allyn's Sky Fury, March 1954; Herkimer .075 Cub Diesel, Feb. 1954; K&B .15, Jan. 1954; Cox Space Bug Junior, Jan. 1954; Herkimer Cub .049B, Sept. 1953; Cameron 2-Speed .19, Sept. 1953; Cox Thermal Hopper, Aug. 1953; K&B .23, July 1953; McCoy Diesel .049, June 1953; Atwood .049, May 1953; Wen-Mac .049, April 1953; Cox Space Bug, March 1953; K&B Two-Speed Torp .19, March 1953; Herkimer Cub .049X, Feb. 1953; Herkimer Cub .14, Jan. 1953; OS "29," Jan. 1953; Cameron .19, Nov. 1952; Fox .29-.35, Oct. 1952; American Telasco Jetmaster "150," Jetex "50" and "350," Sept. 1952; Forster's F-29 & F-31, Aug. 1952.





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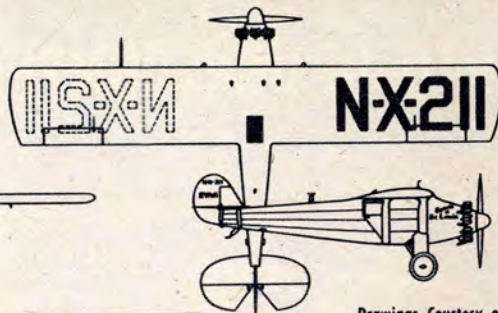
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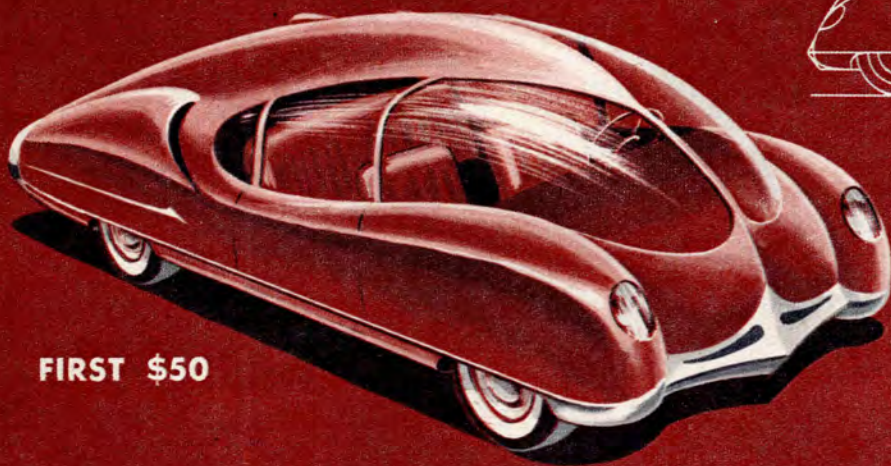
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# AUTO DESIGN COMPETITION



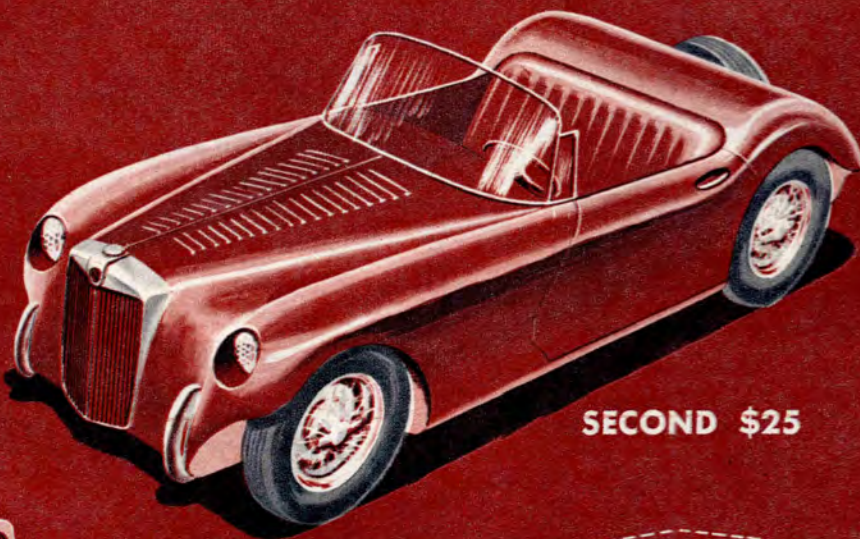
**FIRST \$50**



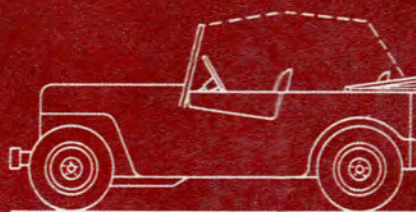
An ultra-modern streamlined sedan by William Allen Roper of Detroit, Mich. Engine is located in the rear, with air ducts in fenders supplying air for cooling as well as to the carburetor. Rear housing for tail lights and dual exhausts acts also as bumper, while slots in front bumper admit air for ventilation, exhausting out of a vent in the roof. The car carries five passengers, two in front in bucket type seats, three in rear.



Mike Stryker of Roseburg, Ore., has modified an MG especially for competition work. The only recognizable feature is the MG radiator; body is "special," combining aluminum and magnesium for light weight and smooth contours for effortless cruising. The engine is of greater displacement, 1600 cc. (96 cu. in.) developing 95 hp. Some 300 lbs. reduction in car's weight and 41 extra hp should give the MG Special plenty of extra zip.



**SECOND \$25**



Production version of modified Jeep based on design submitted by Allen Drachman of La Grange, Ill. Larger than the standard military vehicle, measuring 96" in wheelbase as against 80" of present model. Equipped with five-speeds forward transmission, four-wheel drive and oversize tires, it is capable of negotiating almost any kind of terrain. Four bucket seats have safety belts, removable door is bullet-proof. Six-cylinder, 130 hp engine.



**THIRD \$10**

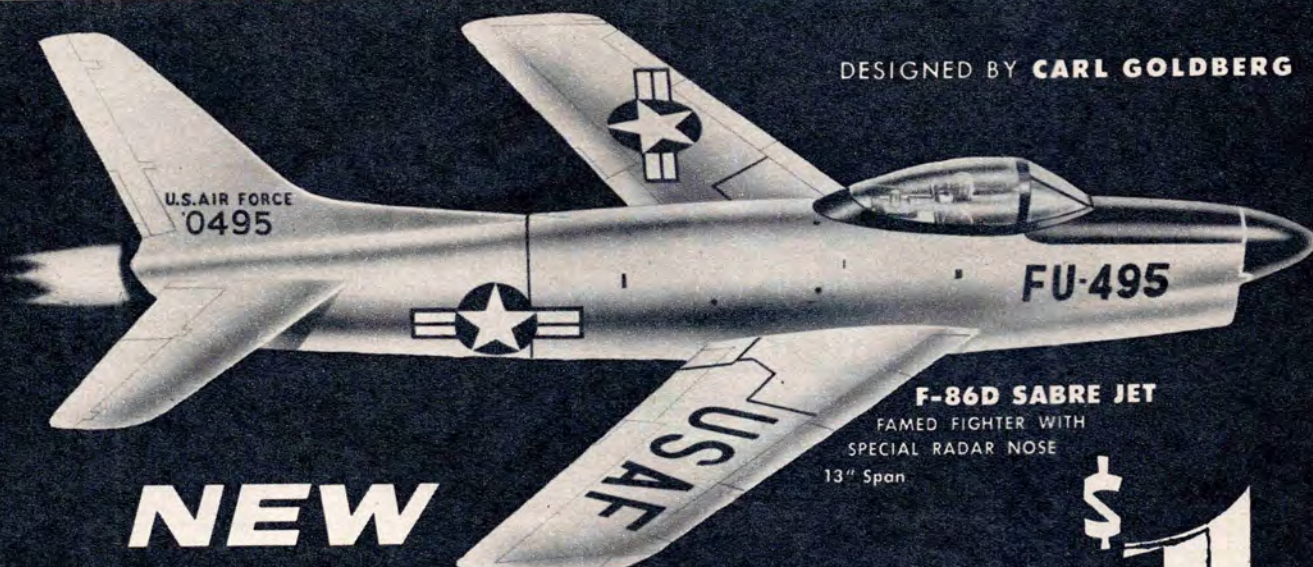
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DESIGNED BY **CARL GOLDBERG**



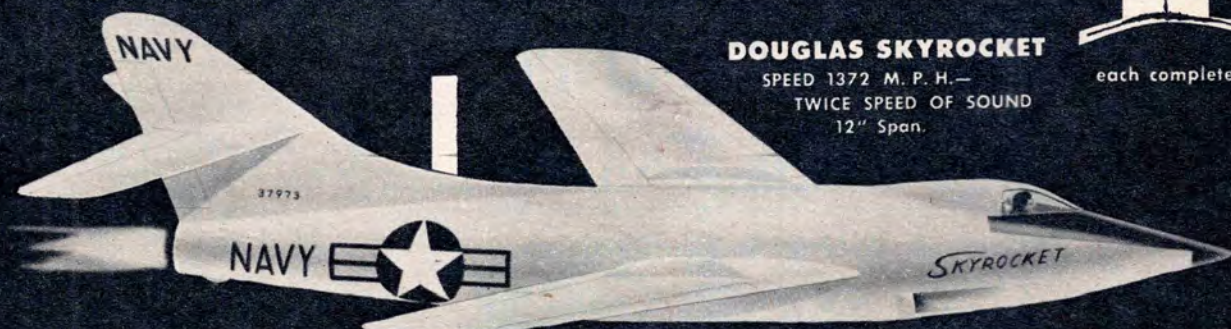
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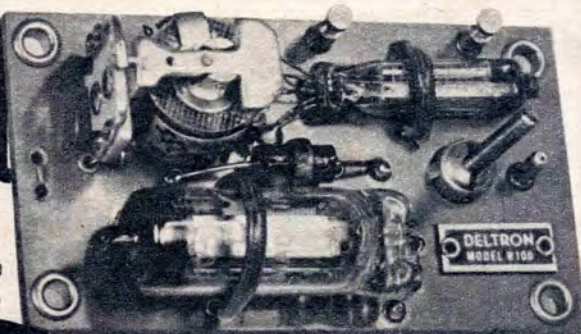
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## Clarifying the R/C Rules

■ With the great surge of interest in radio control contests, your AMA Radio Control Rules Committee feels that a discussion on the present radio control rules and intended methods of application is of vital interest. These rules keep in mind above all the objective of making performance of the pilot and ship, not the quantity or complexity of control, the criterion. This prevents the necessity of breaking down the event into classes. How well this has worked is proven by the assortment of control setups in the winners' columns of major contests. We have yet to hear of a fair setup which would require less than four classes, and the event at present cannot stand such a division of prizes. However, the Committee welcomes your proposals. A second consideration is in writing rules to find the best contestants, as befits national rules, rather than allowing excessive tolerance for beginners. Modifications such as using only the Precision Pattern, may be made at the small local contests, but we contend that they have no place in national rules or any major event.

Now for the use of the rules as intended by your Radio Control Committee.

### Outline for General Judging

1. The basic criterion of judging maneuvers shall be the quality of the pilot's performance, i.e., his ability to get the most out of the ship, its trim and control.

2. The complexity of the control available shall not influence the judging, i.e., complex systems shall not be judged by stricter standards because of the greater degree of control they might be thought to afford.

3. All maneuvers shall be judged solely on the actual maneuver and recovery. Method of entry shall not count, in order to place all systems on an equal judging basis of pilot technique. In recovery, climb, turn or level flight is optional as long as it does not result in a stall.

4. Judging of the maneuver shall be done according to full scale practice, using as a basis: smoothness, coordination, planning and semblance to full-scale maneuvers.

5. Judges shall not discuss scores amongst themselves or with contestants at any time during or after the flight, in order to maintain maximum fairness and individuality.

6. Judges will merely mark the judging form E (Excellent), A (Average), P (Poor) and U (Unrecognizable). This means they will have no point system to remember and all maneuvers are judged on an individual basis.

7. It must be realized that a "judged" contest requires much use of "common sense," and minor variations in interpretations are immaterial—as long as they are applied to all contestants and are made clear at the time of application.

### Precision Pattern Maneuvers

(Items under each maneuver placed in the order of importance)

#### TAKEOFF

a. Straightness of the run within 10'—E; 20'—A; 30'—P; 40' or more—U.

b. Smoothness of climbout, no partial stall. STRAIGHT FLIGHT (Judges signify when the distance is accomplished).

a. Straightness of course within 10'—E; 20'—A; 30'—P; 40' or over—U.

b. Wind drift compensation. c. Smoothness of horizontal flight path.

#### PROCEDURE TURNS

a. Ability to return over the same path as the outbound flight.

b. Planning of turns to compensate for wind drift. c. Smoothness of entries, actual turn and recovery.

#### STRAIGHT FLIGHT (return)

a. Return directly over xmitter.

b. Balance as in straight flight out.

#### S TURN



- a. Planning of flight path to compensate for wind drift and to maintain equalized circles on the axis line.
- b. Smoothness of entries and recovery.
- c. Altitude control, i.e., smoothness of horizontal pattern and maintenance of altitude.

#### FIGURE 8

- a. Symmetry of pattern.
- b. Balance as in S turn.

#### RECTANGULAR PATTERN

- a. Planning of flight path to compensate for wind drift.
- b. Smoothness of turns and precision of recovery on desired headings.
- c. Equalness of sides.

#### SPOT LANDING

- a. Mechanical Measurement. (No judging on smoothness of landing.)

#### Stunt Pattern

In general, the ability of the pilot to plan the positions of the maneuvers for best presentation shall influence the over-all judging of each maneuver. See the general rules in regard to entries of maneuvers.

#### TAKE-OFF

- a. Smoothness of taxiing control.
- b. Realistic stop.
- c. Straightness of the run within 10'-E; 20'-A; 30'-P; 40' or more-U.
- d. Smoothness of climbout, no partial stall.

#### STRAIGHT FLIGHT

- a. Straightness of course within 10'-E; 20'-A; 30'-P; 40' or over-U.
- b. Wind drift compensation.
- c. Smoothness of horizontal flight path.

#### LOOPS (Disregard method of obtaining required speed.)

- a. Smoothness and symmetry of loop (or loops).
- b. Equalness of size in multiple loops.
- c. Deviation from the vertical plane. Each 10 degree deviation means one lower grade, i.e., vertical-E, 80 degrees-A; 70 degrees-P; 60 degrees-U.
- d. Smoothness of recovery and stall prevention.

#### SPIRAL DIVE

- a. Precision of entry and recovery on the same heading. Straight ahead-E; 45 degrees-A; 90 degrees-P; 180 degrees-U.
- b. Severity of dive, i.e., fastest descent best.
- c. Smoothness of recovery and stall prevention.

#### VERTICAL DIVE

- a. Precision of heading. Each 10 degree variation down one grade.
- b. Vertical aspect of dive 70 degrees to 90 degrees-E; 50 to 70 degrees-A; 40 to 50 degrees-P; less than 40 degrees-U.
- c. Smoothness of recovery and stall prevention.

#### ROLLS

- a. Precision of heading, entry and recovery.
- b. Rate of roll.
- c. Smoothness of recovery and stall prevention.

#### OUTSIDE LOOPS

- a. Smoothness and symmetry of loop (or loops).
- b. Equalness of size in multiple loops.
- c. Deviation from the vertical plane. Each 10 degree deviation means one lower grade, i.e., vertical-E, 80 degrees-F; 70 degrees-P; 60 degrees-U.

- d. Smoothness of recovery and stall prevention.

#### INVERTED FLIGHT

- a. Altitude maintenance.
- b. Precision of heading.
- c. Smoothness of recovery and stall prevention.

#### WING-OVER

- a. Precision of heading in recovery. Each 10 degree variation down one grade.
- b. Vertical aspect of the bank at the peak of the wing-over.

- c. Smoothness of recovery and stall prevention.

#### IMMELMANN

- a. Precision of recovery.
- b. Vertical aspect of the loop portion of the maneuver.
- c. Smoothness of recovery and stall prevention.

#### TOUCH AND GO LANDING

- a. Planning of approach.
- b. Accuracy of touch down, that is closeness to the spot-landing area.
- c. Smoothness of actual touch down.
- d. Precision of directional control during the landing.

- e. Smoothness of takeoff after landing.

#### JUDGING OF PRECISION LANDING

- a. Smoothness, i.e., lack of bounces.
- b. Straightness of the landing roll to the final stop.

Two points have come up that require clarification:

1. The spot landing and precision landing can be combined if the contestant calls for them this way.

2. Realizing the difficulty of the prototype ROG, points are awarded accordingly, and time consumed is therefore included in the total flight time allowed.

The Radio Control Committee will, of course, welcome proposals for improvement of next year's rules and only asks that you carefully consider (1) whether such changes will be fair to everyone, (2) it will not add to the complexity of the judging, and (3) will speed up the event so that everyone will get more flying.

Dick Schumacher

6638 Encino Ave., Van Nuys, Calif.

## New! WORLD'S LARGEST GAS MODEL BOMBER B-25



### 67" Span. Length 49". "U" Control, Radio Control, or Free Flight

This 1" scale model can't be told from the real North American B-25 Bomber. Features of the construction set are 3" scale rubber tired alum. disc wheels, 4 1/4" alum. cowls, planked type balsa fuselage, ready cut tail and rudder balsa, alum. guns, all parts, and full size drawing. For easy handling of this model, the outer wing panels are removable, reducing the wing span to 30". Two OK 14 or 23" type motors \$20.00 can be used. Const. set, postpaid.

### CURTIS P40F GAS MODEL



#### 48" Span. Free flight or U Control

Improved with new 2 1/2" alum. spinner and 3" Veco alum. disk semi-pneumatic rubber wheels. Planked type body, parts printed on balsa, and all \$9.00 parts. Set

### REPUBLIC P47D GAS MODEL



35 1/2" span. 1/2" scale. Length 30 1/2". One-piece moulded, clear Plexiglas cockpit enclosure. 2 1/2" scale alum. disk rubber wheels. Body planking full size plans. Uses B or C motor. \$5.95 Set

### 9' TAYLOR CRAFT GAS MODEL



9 foot span. Can use Radio control. Set has 36 ready cut wing ribs, cut plywood body formers, 16" carved prop, tail wheel unit, 2 full size plans, printed balsa, silkspan, etc. Uses "C" type motor, single twin, or 4 cyl. motor. Set without \$17.50 motor or wheels, postpaid. Extra pair of 4 1/2" airwheels, \$3.00

### BOEING PT17. GAS



45" Span. Can use 5 cyl. M5 motor to scale or B or C type motor. U control. Set has scale rubber wheels and all spec. parts, ready cut wing \$9.95 ribs, tail wheel unit and wheel. Const. set.

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### NORTH AMER. SABRE JET F86D



24" Span. Uses 150 Jetex motor. An exact scale model. Plan shows motor installation. \$4.00 Const. set less motor.

### NEW PIPER CUB GAS 1/2 A



26" Span. Uses .035 to .049 gas motor. Set has printed body sides. Very strong and very light; scale rubber Veco wheels and prop. A real beauty in its class. \$2.00 Const. set.

### CURTIS HAWK F11C4



32 1/2" Span. Length 23 1/2". 1" Scale. A real collector's item. Finely detailed. Set has air wheels, ready cut pans, turned balsa cowl unit, parts, printed on balsa. Const. set \$4.50

### Grumman-F3F1



32" span. 1" scale. Const. set. Rubber driven \$3.75

### N. American B-25



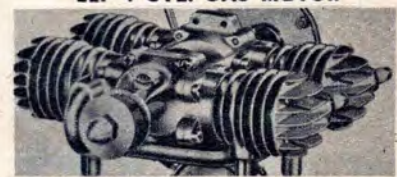
33 1/2" span. 1/2" scale. Const. set. Rubber driven \$4.00

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39" span. 1 1/2" scale. New improved D-8. Balsa sheet sides. Const. set \$7.00

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Elf 4-cylinder 1/2 h.p., 4 1/4" wide. A beautiful smooth running motor. 3 bearings. Ignition type \$49.50 Glow type \$46.00

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**A Speed Demon in Action! Designed especially for the new gas outboard engines!**

Actual photograph of model built from kit.

You'll get the thrill of your life when you send the SEA DART racing through the water!

Designed along latest hydrodynamic principles to insure top performance and stability, this 16" all-plastic model includes such special features as—Completely finished hull (including bridle mount) of high-impact Styron plastic, designed to thrive on the most rugged use! Die-cut Styron engine mount and cockpit fairing parts! Authentic racing-type decals! Can be assembled in minutes... operated either tethered or free! Your dealer has the SEA DART—ask him for it today!

**\$395**  
Length 16"  
Kit B-12 Beam 6½"

\*Also for electric outboard motors

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| Kit                   | Price      |
|-----------------------|------------|
| Monocoupe             | C-1 \$4.95 |
| Howard Pete           | C-2 5.95   |
| Mr. Mulligan          | C-3 4.95   |
| Waco                  | C-4 5.95   |
| Polish Fighter        | C-5 5.95   |
| SE 5                  | C-6 5.95   |
| Ryan S-T              | C-7 5.95   |
| Fokker D-VII          | C-8 5.95   |
| Corsair F4U-1         | C-9 5.95   |
| Ring Master           | S-1 2.95   |
| F-51 Mustang          | S-2 2.95   |
| Yak-9                 | S-3 2.95   |
| Space Master, Jr.     | S-4 2.25   |
| R. C. Piper Tri-Pacer | FS-1 10.95 |

#### POWER BOATS

| Kit                                                 | Price      |
|-----------------------------------------------------|------------|
| Richardson 27' Cruiser                              | B-1 \$5.95 |
| Higgins 17' Speedster                               | B-2 4.95   |
| Chris-Craft 47' Buccaneer                           | B-3 7.95   |
| Century Resoriter '20'                              | B-4 3.25   |
| Century Sea Maid '20'                               | B-5 2.95   |
| Chris-Craft 32' Cruiser                             | B-6M 9.95  |
| Deluxe 34-pc. scale marine fitting set for Kit B-6M | B-6F 3.50  |
| Chris-Craft 50' Catalina                            | B-7M 11.95 |
| Deluxe 66-pc. scale marine fitting set for Kit B-7M | B-7F 4.95  |
| Century Sea Maid '20'                               | B-8M 7.95  |
| Deluxe 35-pc. scale marine fitting set for Kit B-8M | B-8F 3.95  |
| Higgins 26' Express Cruiser                         | B-9 3.95   |

#### Harco '40' Deluxe Cabin Cruiser

|                                                       |             |
|-------------------------------------------------------|-------------|
| Deluxe 64-pc. scale marine fitting set for Kit B-10M  | B-10M 10.95 |
| Chris-Craft 63' Motor Yacht                           | B-10F 4.50  |
| Deluxe 108-pc. scale marine fitting set for Kit B-11M | B-11M 18.95 |
|                                                       | B-11F 7.50  |

#### MARINE DRIVES

| MARINE DRIVES                                |  | Price  |
|----------------------------------------------|--|--------|
| 1/2 A (1/4" dia.) Gas Marine Drive           |  | \$2.95 |
| A (3/8" dia.) Gas Marine Drive               |  | 3.95   |
| BC (1/4" dia.) Gas Marine Drive              |  | 3.95   |
| Electric Marine Drive                        |  | 2.25   |
| Marine Fittings Also Available Individually. |  |        |
| Ask Your Dealer.                             |  |        |

## Mac-Mech Pulser

(Continued from page 43)

doubtless differ a bit from those used here. For example, the contact strips B and C came from a defunct lever switch and are quite long. Strips from relays may also be used, or you can cut them from spring brass or phosphor bronze; about .015" is a good thickness. If you use a different spring length, note that the position of cam D should be shifted so that you get the proper movement of C. Or you can alter the throw of D by changing the pivot location. If you don't want to bother with the Lord mounts, use three or four grommets (of the size to fit about a ⅜" hole) and washers as shown in Fig. 2, to support the base plate.

For a smooth-working pulser, real care must be taken in making the parts and fitting them, especially cam A and the worm gear on their shaft O, and Cam D on its shaft J. Access to a drill press and possibly a lathe will aid in this work. If you don't have the facilities to do a top grade job, we strongly recommend that you build an electronic pulser, such as that described in our Jan. '54 issue. If

you can do a good job on the pulser we have described here, we are certain you will be pleased with the smooth, silent, and ultra-reliable operation it can afford.

**Parts Required:** One Pittman low voltage motor—Control Research. One pair of gears to suit (see text). One pair contact springs (B and C) removed from a lever-type switch. One wooden file box (Deco #400) 3 x 5 x 2¾". One on-off slide switch for motor. Three Lord mounts—flat type, rated at 3 lb. Two gum rubber grommets, 3/16" ID x 5/16" mounting hole size. Required length of cable, Belden 8446 or equiv. Raw materials per parts drawings.

## Speaking of Hobbies

(Continued from page 19)

a score of twenty-two points.

Two other novelty events were flown: A. J. Jetex, where contestants used any American Junior Aircraft Co. product with any Jetex unit, the winner being the one with the longest single flight; and a semi-team race event called the 10 Mile Race, flown similarly to the California Rat Race. The race consisted of 140 laps on 60-foot lines with two pit stops re-

quired, and four planes were flown at a time. The fastest and winning flight was made by Al White with an elapsed time of ten minutes and thirty seconds.

The Free Flight Events, with one exception, ran true to form. The exception was Hand Launched Glider, in which the largest number of contestants competed. One chance on the Round the World Trip was given for each official flight, and H/L Glider allowed nine official flights.

Camping was permitted on the flying site; though shop facilities were available to work on models, most contestants chose to set up their own repair depots closer to the flying field. Floodlights and searchlights permitted night flying.

Jim Walker set up camp on the field with a truck load of motor scooters, Firebaby and Firecat kits, and miscellaneous equipment for the enjoyment of all concerned. Sunday and Monday afternoons he put on his demonstrations, attracting large crowds with his radio-controlled lawn mower, sabre dance, and three plane flights. A new attraction, a motor controlled T-28 profile Half-A was demonstrated, with many contestants having an opportunity to try it. The new Walker "Firecat" profile stunt model is about the ultimate in prefabrication.



# A Circus of *Stunts* in the Air!

## RING MASTER, JR.



Actual photograph of model built from kit.

**Does  
Everything  
in the Book—Plus!**

Kit S-5 Span 30"  
Length 21½" For  
engines from .09 to .19

**\$1.95**

This is it! The Jr. model of the famous Sterling Ring Master . . . created by Matt Kania, world-renowned model designer. The RING MASTER, JR. will do every stunt in the book—and then some! Built of quality balsa wood with such special features as—Shaped and notched leading and trailing edges. Die-cut ribs and tail surfaces! Die-cut plywood parts! Die-cut fuselage! Decals! Formed wire landing gear! Hardwood motor mounts! EASY-TO-READ, STEP-BY-STEP PLANS AND INSTRUCTIONS! See your dealer now—start stunting with the RING MASTER, JR.—easy to build, and a snap to fly!

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Three large, special trophies were awarded: Highest Speed Flown, won by Capt. James S. Jones of Fairchild Air Force Base, with 146.64 mph. Highest Flight Time in any Free Flight Event was won by Herb Talabere of Walla Walla; and High Flight Score in Acrobatics (appearance points not counted) won by Dave Weigandt of Portland, Oregon.

Fort Lewis Special Services, with whose cooperation the contest was arranged, also awarded a large trophy for the Ft. Lewis contestant making the highest accumulated score, and it was won by CWO Max Wagner.

The climax of the contest was the drawing for the Grand Prize of a trip around the world, the chances being awarded one for each official flight, 10 for each first place, 9 for each second, etc. The suspense was evident on every face as the drawing proceeded, the first name to be drawn three times winning. With many contestants' names being drawn twice, Gil Coughlin of Tacoma hit the three-time Jack Pot, winning the trip.

By the time this is published, the Parisians have probably been wondering how the gliders floating down in the

streets spanned the Atlantic. They had better check the Eiffel Tower!

—Earl Witt

### Fletcher FL-23

(Continued from page 46)

tip from soft balsa and cut out for stabilizer. Place the fin on the fuselage and fasten with rubber bands and mount the wings. Cement the stabilizer in place when you have it lined up with the wing, check that it has no angle of incidence. Cover the fin with tissue to give it some more strength. Cement the dorsal fin (of 1/8" sheet) to the fuselage.

With engine removed, go over the entire model with sandpaper to remove any irregularities. Apply a coat of wood filler and sand smooth. Go over the entire model with two or three coats of aluminum dope, even the inside of the cockpit. Sand after the first coating if necessary. Add the windshield and cockpit enclosure before applying jet black dope on the anti-glare panel. Now it is time to install the wheels and add all small details such as position lights, pitot tube, exhaust stacks and aileron controls. All control surface outlines are inked on. To

simulate the corrugations on the wing panels you can either make it in ink or make small depressions with a hard pencil. All lettering is done with black Trim-Film. If you use a diesel you only have to apply a coat of fuel proofer to the inside of the cowlings.

If you have installed a glow plug engine you must give the entire plane a coat of fuel proofer and the engine space a double coat. The engine has 3.5° down thrust and 3° right-thrust. The right-thrust may be lessened after the first few flights to adjust the flight pattern. Try to get a gentle right turn under power. Test the model in a field of tall grass for the best glide, by adding or taking off nose weight, and when a nice even glide is obtained, fly it with power. Make the first flight on a short motor run, and with the engine throttled down. As adjustments are made to correct the flight characteristics, the engine is gradually given more power until it is operating under full power. Do not hurry this process because it often leads to a bad crackup. R.O.G. flights look best when the model taxis a little first and does not jump off like a contest model. To avoid excessive torque forces use props of large diameter and low pitch, 6/3 or 7/2.



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## 'Round the Track

**News, views and comments  
from the miniature  
car fans, here and abroad**

■ Once again we ask that car racing fans and builders send us race results, news of local doings, and just any info at all on their favorite hobby. We really want to give you car men the nationwide news—but we sure can't do it if you don't help us out. We receive the very complete AMRCA News Bulletin from Secretary Carl Noward. Carl's address is 1384 Berdan Ave., Toledo, Ohio, for anyone who wants membership info.

We'll have to exempt Bob More (66 W. Elizabeth Ave., Bethlehem, Pa.) from the above plea—wish more car racers would keep us as well supplied with news as Bob does! He says racing at Fox Speedway finally gave Howard Fox a chance for his first win of the year; just a few weeks before, Howard's faithful old car had been wrecked when the hook failed. Running a rebuilt car that had also been partially wrecked, he got 146.58 mph. Close on his heels—or tail-light—came Bill More's No. 98, with 146.34; local mathematicians figured that the .24 mph difference in the two times amounted to only 2 ft. over the quarter mile distance! Top results were:

### CUSTOM PROTO CLASS

|                    | Hometown        | Car Type | Speed in mph |
|--------------------|-----------------|----------|--------------|
| 1. Howard Fox      | Bethlehem, Pa.  | Fox      | 146.58       |
| 2. W. S. More      | Bethlehem, Pa.  | Fox      | 146.34       |
| 3. B&E Racing Team | Paterson, N. J. | Feczko   | 142.86       |
| 4. Bob Bratton     | Paterson, N. J. | Bratton  | 141.07       |
| 5. Bob More        | Bethlehem, Pa.  | Arrow    | 140.84       |
| 6. Dave Berman     | N. Y. C.        | Own      | 140.84       |

### MANUFACTURED PROTO CLASS

|                 | Hometown         | Car Type | Speed in mph |
|-----------------|------------------|----------|--------------|
| 1. Stan Heckler | Cherryville, Pa. | Arrow    | 130.81       |
| 2. Sal Lollo    | Brooklyn, N. Y.  | Arrow    | 125.87       |
| 3. Wm. Geiger   | Bethlehem, Pa.   | Arrow    | 120.32       |
| 4. Joe Sampias  | Paterson, N. J.  | Arrow    | 113.20       |

In the Manufactured Proto group, Stan Heckler tied the World Record with 130.81 mph; this time had been set by Franny Wolf a year earlier. Local hot-shots were happy to see Dave Berman—a long and faithful follower of the sport—break 140 for the first time; Bob says that Dave "twisted all the bolts in the right direction, poured in the right juice and—pfft—140.84."

The Triboro Club of New York City sponsored a race at Fox Speedway (Bethlehem, Pa.—where else?!) and in spite of poor atmospheric conditions, top time of 144.23 was made by William More. Unexpected competition came from underdog Ed Rogers of Hartford, Conn., who was just under More's times all day long, but managed to nose out veteran Howard Fox, who had difficulties with the slick track surface. Manufactured Proto was taken by a visitor from Long Island—Al Holicza; it was his first such win. Stan Geiger's car had tied the World Record only three weeks previously, but on the 20th, persistent ignition trouble robbed him of about 5 mph. Times were:



R. L. Brown and Atwood-powered Half-A "air" car. These run on 13 ft., 9 inch lines and are timed for 10 laps (1/6th mile). Fastest speed with this car was 33.7 mph. Best speed recorded at press time was 12.7 sec., or 47.3 mph. Four wheels, pylon motor mount.

### CUSTOM PROTO

|                    | Hometown           | Car Type | Speed in mph |
|--------------------|--------------------|----------|--------------|
| 1. W. S. More      | Bethlehem, Pa.     | Fox      | 144.23       |
| 2. Ed Rogers       | Hartford, Conn.    | Fox      | 143.31       |
| 3. Howard Fox      | Bethlehem, Pa.     | Fox      | 142.40       |
| 4. Bob Bratton     | Paterson, N. J.    | Bratton  | 141.73       |
| 5. B&E Racing Team | Jersey City, N. J. | Feczko   | 140.84       |

### MANUFACTURED PROTO

|                 | Hometown         | Car Type | Speed in mph |
|-----------------|------------------|----------|--------------|
| 1. Al Holicza   | Paterson, N. J.  | Arrow    | 127.84       |
| 2. Bill Geiger  | Bethlehem, Pa.   | Arrow    | 126.22       |
| 3. Stan Heckler | Cherryville, Pa. | Arrow    | 125.87       |
| 4. Sal Lollo    | Brooklyn, N. Y.  | Arrow    | 122.78       |
| 5. Paul Bond    | Allentown, Pa.   | Arrow    | 121.95       |

A note from Harry Vermehren (Box 191, Mount Holly, N. J.) requests the address of an AMRCA official. Seems Harry has a new Dooling car with fly-wheel assembly, and an O&R .29 racing engine that he does not need. He says car racing is not very active in his area, and feels maybe some of the boys in other sections might be interested in obtaining the items.

Carl Noward makes the interesting observation that his travels around to many races this season seem to indicate that the boys are having a better time, and are not so much out for blood as has been the case in the past. If this is so, it will undoubtedly, as Carl observes, serve to interest many newcomers in the race car hobby.

Word comes that a new World's Record speed of 151.77 mph was set on June 20 by Walter Wilson, Jr., of the Belleville, Ill., Club, at the Anderson track. On his first run, the timers wouldn't believe the clock, so Walter made another run, and there was the record-breaking time again



—but still faster!

A race at Columbus, Ohio, showed rather poor times, probably due to low temperatures and very low humidity. Troubles seemed to beset most everyone, and to top it off the timer went haywire. All hands set to, to try and fix it, but without success, so three human timers armed with stop watches were appointed—seemed like the good old days! times were: *Custom Pronto*. 1—Red Abraham, own car, 134.32; 2—Wilbur Mercer, 1234, 131.38; 3—Joe Feimer, 1379, 131.19; 4—Earl Oliver, 1234, 129.68; 5—Bill Bissman, Fairabend, 129.49; 6—Clarence Miller, H&M, 127.47. *Custom Sportsman*. 1—Art Habig, own, 128.93; 2—Earl Oliver, 1234, 127.84; 3—Jack Oliver, 1234, 124.65. *Class A*. 1—Ray Hunter, C&R, 123.27; 2—Red Abraham, Challenger, 110.42; 3—Earl Oliver, 1234, 107.39. *Class BB*. 1—Guy Richards, Invader, 119.36. *Class B*. 1—Siegmeyer, Railton, 101.01; 2—Red Abraham, P3, 97.93.

The New Castle Miniature 500—at New Castle, Ind.—brought out a total of 42 cars, and competition was really tough, with 13 cars making over 140. Four ties developed, several of them among those near top place. Winner's prize was a 3-second electric soldering iron. Contestants received free ham sandwiches and hot dogs, and there was even a dog fight between pooches owned by a couple of the high point men, to enliven proceedings. Winners were:

#### CUSTOM PROTO

|                   | Hometown         | Car Type | Speed in mph |
|-------------------|------------------|----------|--------------|
| 1. Paul Kruse     | Fort Wayne, Ind. | 1234     | 148.51       |
| 2. Carl Franz     | Lafayette, Ind.  | Own 1    | 146.10       |
| 3. W. Wilson, Jr. | St. Louis, Mo.   | Fox      | 144.23       |
| 4. B. Bissman     | Mansfield, Ohio  | 1234     | 144.23       |
| 5. Howard Fox     | Bethlehem, Pa.   | Fox      | 143.76       |

The Western Regionals, back on June 20 under perfect weather conditions, provided quite a few unscheduled events, among them broken front axle, a couple of stuck pistons, etc. Bill Weatherwax was hard luck man of the day; he drew place #13 to run, and lost a rear wheel on his first run. On the second run, he went the last two laps upside down, and did the same on the third—a record of some sort. Winners were:

#### CLASS BB

|                  | Hometown         | Car Type  | Speed in mph |
|------------------|------------------|-----------|--------------|
| 1. Guy Richards  | Akron, Ohio      | Invader   | 115.97       |
| 2. Bill Williams | Charlotte, N. C. |           | 110.15       |
| 3. Carl Noward   | Toledo, Ohio     | Pacemaker | 94.04        |

#### SPURS

|                   | Hometown        | Car Type   | Speed in mph |
|-------------------|-----------------|------------|--------------|
| 1. James Petrakis | Bethlehem, Pa.  | Own        | 132.15       |
| 2. Jerry Pope     | Champaign, Ill. | Borden     | 127.84       |
| 3. Bill Bissman   | Mansfield, Ohio | Cable King | 117.34       |

#### CUSTOM

| 1. Bill Terra     | 1234 | 140.40 |  |
|-------------------|------|--------|--|
| 2. Bart Dimmetted | 1234 | 139.96 |  |
| 3. Al Terra       | 1234 | 138.88 |  |
| 4. Donna Terra    | 1234 | 138.88 |  |
| 5. Ed Baynes      | Fox  | 137.40 |  |

#### MF'G

| 1. Donna Terra      | Arrow     | 125.87 |  |
|---------------------|-----------|--------|--|
| 2. Vincent Dimattio | Arrow     | 95.74  |  |
| 3. Al Terra         | Arrow     | 119.20 |  |
| 4. Cass Smith       | Dooling F | 69.75  |  |

#### CUSTOM SPORTSMAN

|                | Hometown     | Car Type    | Speed in mph |
|----------------|--------------|-------------|--------------|
| 1. Carl Noward | Toledo, Ohio | Noward 1234 | 129.10       |
| 2. Joyce Habig | Toledo, Ohio | Own         | 126.40       |

Many new track records were set up during the May-June period, some of them being as follows: Detroit Mich., Joe Kantrow Jr., 145.16; Cleveland, Ohio, Glenn Fairabend, 144.00; Belleville, Ill., Carl Franz, 146.57; Columbus, Ohio, Red Abraham, 134.32.

We've mentioned in past issues the Half-A air prop racing that is giving the West Coast boys so much fun (at such little cost). A few more notes on this have come from R. L. Brown (129 N. Oak, Chino, Calif.). The cars range all the way from real neat streamliners to what might be called "engine-driven" (Continued on page 66)

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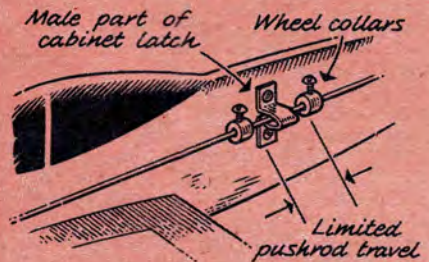
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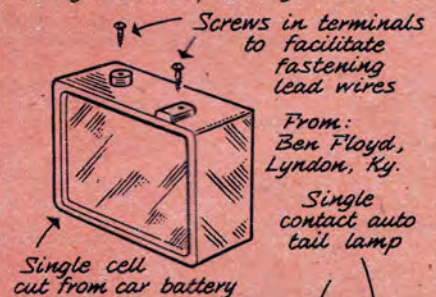
Profile trainer can be equipped with fittings to prevent overcontrolling says Donald Blass, Clinton, Miss.



# Sketch-book

Have you developed something new in construction, control or flying? Send a rough sketch—we'll redraw it and pay \$5 for each accepted. Contributions should be original ideas; sorry, we cannot enter into any correspondence on submissions.

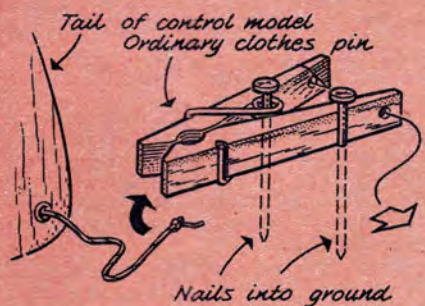
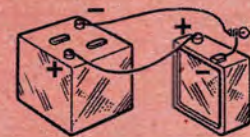
Single cell sawed from car battery makes fine starting cell... Recharge from car battery with lamp in neg. lead—



From: Ben Floyd, Lyndon, Ky.

Single contact auto tail lamp

Single cell cut from car battery



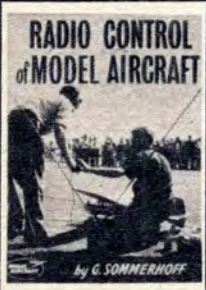
Knotted string held in spring-type clothes pin is released by separate line for "stooge" by Parker Anderson, Littlefield, Texas

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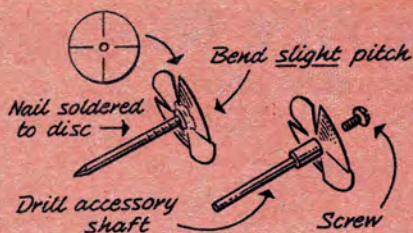
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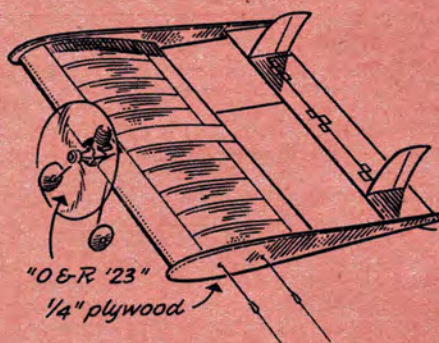
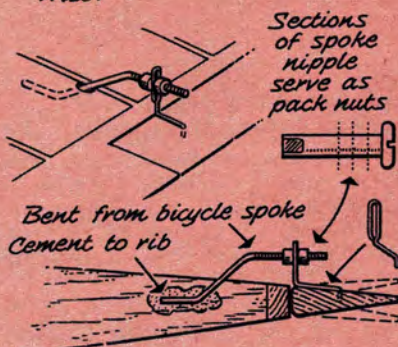
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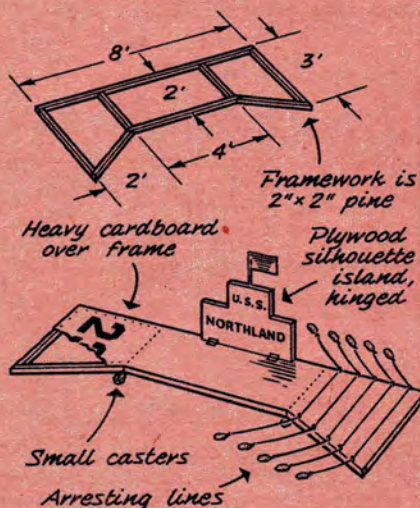


▲ L. M. Waldorf, Binghamton, N. Y., makes tool for mixing dope, powered by a small electric or hand drill —

▼ Tab setting device is light; makes for precise flight trim of freeflight models says Rodney Helgeland, Mt. Horeb, Wisc.



▲ "Flying Plank" is new combat design of Richard Melnick, Bellerose, L. I., N. Y.



▲ Homebuilt "Navy Carrier" deck for A/2 control models is miniature of official type, simplified for easy building, handling — Submitted by Dennis Searts, Bemidji, Minn.

# 20,000,000

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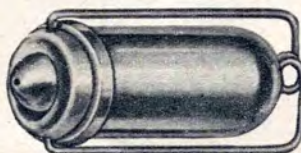
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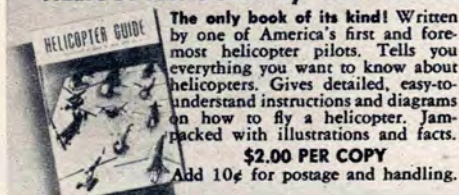
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## HELICOPTER GUIDE by "Les" Morris

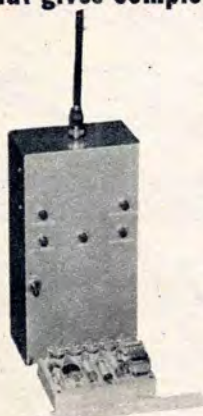


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Bonner Servos, available at moderate prices are highly recommended. Resonant Reed Assembly, 5 Channel **\$19.95**

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(Continued from page 63)  
spiders"—which have nothing much but a wire framework to hold the engine and wheels together. When Brownie wrote, top speed was held by Dick Everett and Butch Cameron—around 43 mph. There are practically no rules to hamper car design, but they are not allowed to have any sort of horizontal lifting surfaces. Lines are about 12' long. The boys have not decided what sort of car is the best, but a four-wheeler with the engine setting rather high and running a tractor prop seems to be the fastest. A plywood fin is often added to help maintain directional stability.

## The Readers Write

Let's hear from you! Address all letters to Air Trails HOBBIES For Young Men, 304 E. 45th St., New York 17, N. Y.

**Wrong View at the Lake . . .** After reading the July A.T.H. I believe you have made a mistake in the name of the town where the Aerocar is built. It should be Longview, Washington, not Lakeview. We fly our R.C. airplanes at the airport where the Aerocar is built. Mr. Taylor has been very cooperative with us Fly Boys and lets us use the airfield any time we want to fly R/C. A.T.H. is my favorite magazine and I enjoy all the articles you put in it.

Delmar W. Olsen, Longview, Wash.  
. . . Longview, not Lakeview, Washington. It is a nice plane and a better car, but seems to wobble slightly in flight. Other than that, you have an excellent magazine, one that covers all of my many interests (except girls). Keep them coming.  
Bill Harrison, Rainier, Ore.

**Scale Man . . .** I would like to congratulate you for the number of model plane plans



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that you have been using in your magazine. The series by Walter A. Musciano was a scale modeler's dream, but Frank Lashek's B-24 in the August issue topped anything that you have previously published.

I sure hope that you will continue to publish such excellent plans for scale models and that you will encourage such noted designers as Musciano, Lashek, Cal Smith and others to continue designing such masterpieces.

In conclusion, I would like to see more twin and multi-engine projects and, if possible, more scale models of present-day aircraft including jets.

John Anderson, Gainesville, Fla.

**Boat Fan . . .** Your Hobbies for Young Men is much better than any hobby magazine I have ever seen. I am glad to see that it also covers model boats.

Mac Rogers, Bastrop, La.

**Another View . . .** In an issue some time back you said "three views of Boeing P-26A." But there were four views. I enjoyed them anyway and wish you would have more of them.

Pat Wolf, West Los Angeles, Calif.

• Technically speaking, Pat, the plan-view may show both bottom and top, but it's really just one shape.

**He Says "Stet" . . .** Thanks for a very fine magazine (ATHFYM). Don't change it. Leave it as it is. It's great.

John Campbell, Tuscarawas, O.

**Did We Leave the Track? . . .** I'm glad to see you're back with the race car round-up.

Donald Bill, Ontario, Calif.

**Hunk of Info . . .** This is the first time I've written you but what I want to say is you have about the best hunk of paper printed. You cover all phases of aviation, both modeling and real, which no other magazine to my knowledge does. I was delighted with your Model Annual for 1954. It was the first one I've gotten. Even though I only build scale solids, I enjoyed it greatly, especially the lists of models and aircraft manufacturers. Keep up the good work just as you have been doing.

Dudley Cate, Fairfield, Conn.

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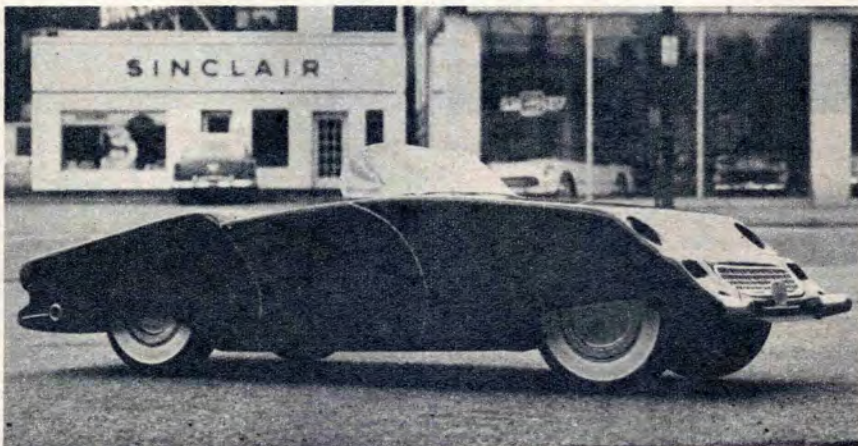
## REALISM-IN-MODELS PHOTO CONTEST

# VEHICLE WINNERS

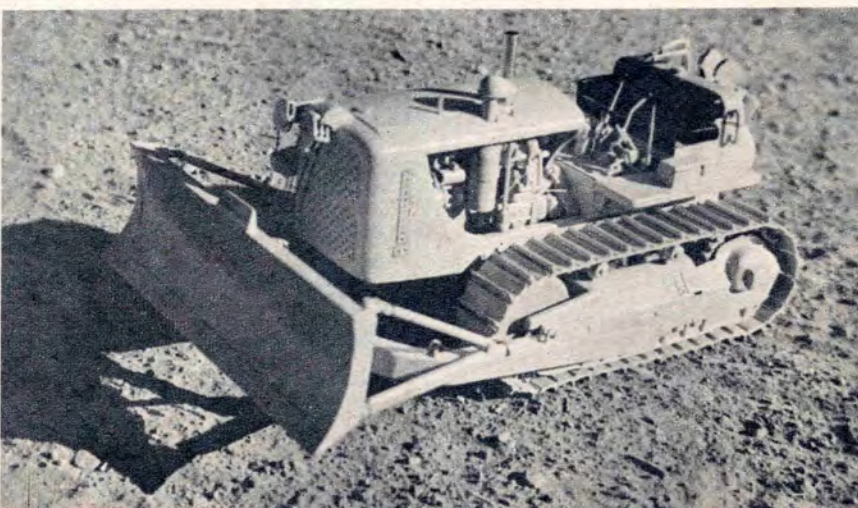
First to close in ATHobbies' "most realistic model" photo competition was the sub section with winners presented last month. Now we give you the top vehicle photographs. Next come model planes, to be followed by boats.



First place and \$50 go to John P. Vahey of S. Boston, Mass., for half-inch to foot model of old-time chemical fire engine posed in front of authentic scaled and detailed fire house.



Second award of \$25 to Robert Andris, Chicago for his photograph of an original design car. Lens to model distance was 2 feet; lens to background distance was 50 feet. Quite realistic.



Robert Jensen, Las Vegas, Nev., turned out this original working model of D8 Caterpillar tractor. Run by 6 V. motors off heavy duty batts. Blade lifts, lowers; made from sketches, pix.

Air Trails HOBBIES For Young Men



## Aqua-tivities

(Continued from page 15)

Line time shall not exceed 5 minutes.

The club has elaborate rules for Senior-Junior Sponsorship, and has club engines that are loaned to qualified Juniors who are unable to purchase their own.

It is possible that the Detroit club might be able to furnish a complete set of rules to interested parties—write to Charles Baxmann (2991 Garland Ave., Detroit 14, Mich.).

A question has been received from Stephen Saperstone (222B 144 St., Neponsit 94, N. Y.); says he is building an R/C boat and finds an escapement doesn't have enough power to move the rudder—asks what *does*. Many builders have used ED clockwork escapement for this—in fact, we have heard of use of this escapement to turn a Half-A outboard motor, for steering purposes, which proves it has lots of power. Another good bet is the Dmeco Multi-Servo—an electric motor driven gadget that gives the same sort of operation as an escapement, but uses electric power instead of rubber bands.

Still another item that may be had at many hobby shops is the Bonner motor-driven servo; this was developed expressly to move the elevators in model planes, but is ideal for boat rudders. It is not self-centering—holds the rudder just where you leave it; has no limit switches, but built-in clutch allows motor to continue turning if power is held on after control arm reaches either extreme. Intended especially for proportional control, the Fenners-Pike Servo, and the Flyball actuator both have plenty of power for boat rudder moving purposes.

**The Marketplace.** An extensive line of blueprints and casting sets for steam and gas engines suited to boat use is listed in the latest catalog of Octura Models (Box 536, Park Ridge, Ill.). Steam engines from simple oscillating type to a triple-expansion marine job are shown, and the gas engines include several world record holders, as well as two and four cycle sport designs. Complete catalog costs 10¢.

Complete power plant for steam model boats may be had from Allyson Co. (910 Watertown St., W. Newton, Mass.). Engine is of single cylinder oscillating type; boiler is fitted with whistle and safety valve, and is fired by two-burner alcohol lamp. Steam line connecting the two has a displacement lubricator. Plant runs for about 20 minutes on a filling, is recommended for boats up to 28" length, sells for \$11.95. A propeller and shaft kit designed especially for this plant sells for \$1.98, includes 2" three-bladed prop, 8" shaft with necessary tubing and support strut, and coupling dog for engine crank-shaft.

Electric outboard motor called the I.M.P. Mercury is sold by International Models, Inc. (33 Union Sq., New York 3, N.Y.). Motor has clamp to attach it to boat, swivel and lock for steering, and built-in on-off switch. Overall height is 3¾", weight 3½ oz., and unit has ⅞" prop. Same concern markets kit for an 18" long single step racing-style boat designed especially for this motor—price is \$4.00. Catalog showing these and other boats and kits, plus a large line of model boat fittings of all sizes sells for 10¢.

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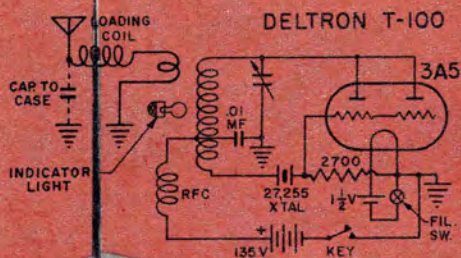
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#### Specifications

**Transmitter:** Model T-100, using single 3A5 tube (elements connected in parallel) and Petersen Z9A crystal. Case size, less projections—3x5x7". Toggle switch for A power, and snap-type push button for controlling signal. 4-section collapsible antenna projects 8¾" above case when folded, and 40" when open. Single tuning adjustment reached through hole under removable button on front panel. 60 ma. pilot bulb used as radiation indicator. Weight with all batteries—4 lbs., 4 oz.

**Battery requirements:** One 1½ V battery for filaments (Eveready 742 or equivalent)—220 ma. drain. Two B bats. (Eveready 457 or equivalent), total of 135 V—drain with antenna extended, about 25 ma.

**Receiver:** Model R-100. Requires one Raytheon RK61 and one CK542-DX. Base size, 3x1½", about 2" thick over all projections. Weight with tubes, power cable and plug, 2.1 oz. Screw adjustment for tuning. Antenna coil may be moved, if operation is not satisfactory. 27" antenna has clip-on end. Relay has screw spring tension adjustment. Escape-ment connections made through power cable.

**Battery requirements:** Minimum sizes recommended, A—two pencils in parallel—1.5 V at 65 ma. B—two 22½ V units (Eveready 412 or equivalent) connected in series, 45 V. First tube idles at .5-.75 ma., drops to .1 ma. on signal. Second tube idles at zero, draws about 2.7 ma. on moderate signal. Batteries should be discarded when A drops to 1.3 V with the set on, and B drops to 40 V, with set turned on and signal tuned in.

#### PREVIOUS R/C SET REVIEWS

Citizen-Ship 465 mc., Aug. 1954 issue; North American Dynatrol, July 1954; Babcock, June 1954; Enterprise Control Master, May 1954; ECC Telecommander, April 1954; Philmore, March 1954; Berkeley "Super Aerotrol," Feb. 1954; E.D. Aristol, Jan. 1954; Citizen-Ship "27," Nov. 1953; Babcock BCT-2 and BCR-3, Oct. 1953.

Each review covers both transmitting and receiving equipment.

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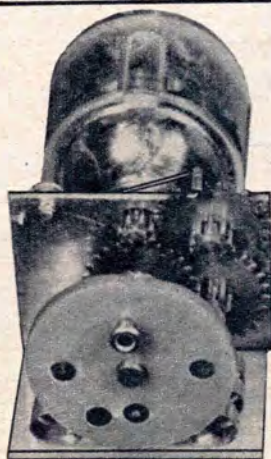
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Streamlined hard-top has doors that curve up into roof, making it easier to enter and leave. Note how bumper circles car completely.



American-designed, this new model was hand-crafted in Italy. Chrome-plated wire wheels add style, help cool brakes and tires.

## Economo

(Continued from page 49)

by two strips of pine that run fore and aft along each side, and have wire hooks in them to hold a rubber band. Leave the connecting wires a bit long, so you can pull the case out of the cockpit to change batteries.

As mentioned at the beginning, the battery life is exceptional. The motor will run on just a whisper of power, and by allowing it to turn at fairly high speed, even when loaded by the prop, we make the most of its low-current qualities. On six volts, and with the boat held still in the water, the current drain is only 30 milliamperes, a figure that allows many hours of service from a single set of batteries. How many hours depends upon how fresh the batteries were when you bought them, and also, how long the boat runs, in relation to how long the batteries are allowed to rest.

Representative figures for standard pencils show that if you let the motor run continuously, the boat will still be going at the end of five or six hours—but speed will drop, since the total voltage will then be around 4 V. Needless to say, if you give it short runs of 15 min. or so, and let it rest between, you'll get much longer life. And if you want real long distance running, obtain some of the special hearing aid pencils—such as Eveready 1015E or 1016E. These will multiply the length of service mentioned above by about three to five times!

When you consider the tiny amount of power that goes to the motor, you will understand that this ship is no speed demon. With 6 V., it runs at a moderately slow walking pace—but it will keep on going at this pace for hours afterward.

Air Trails HOBBIES For Young Men



# Springfield Models

964 SPRINGHAVEN ROAD

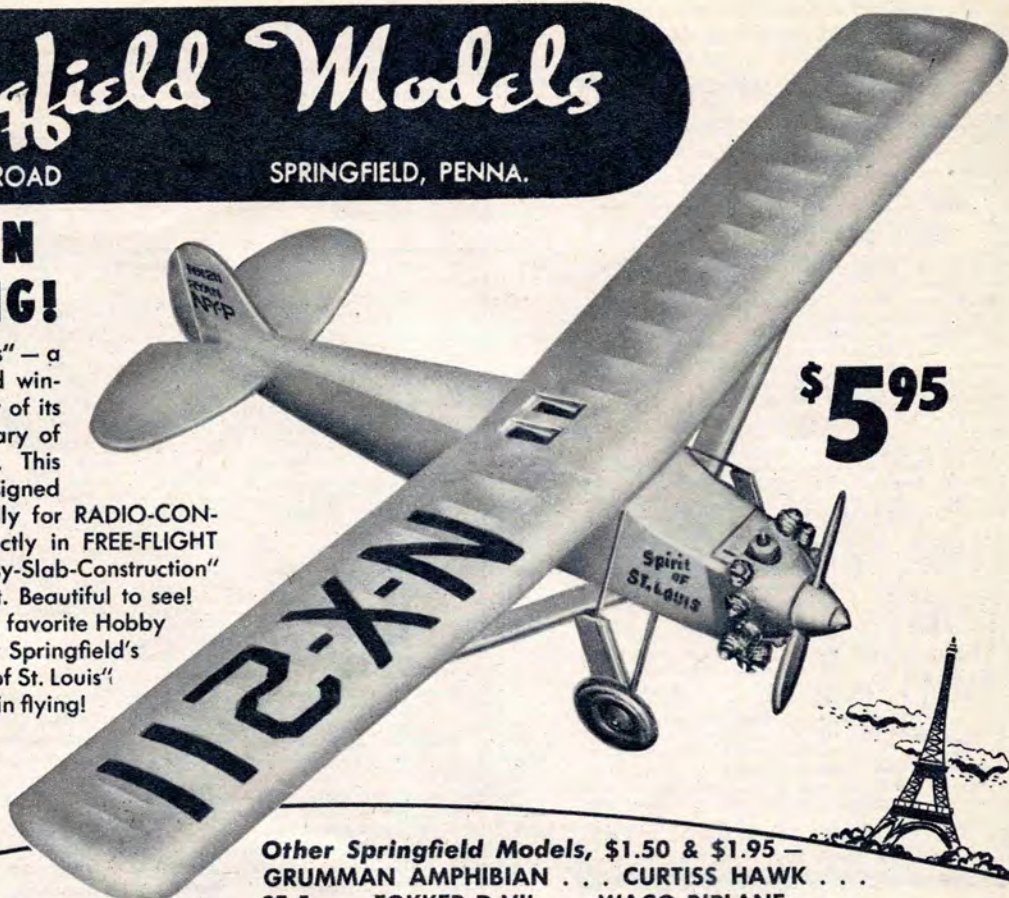
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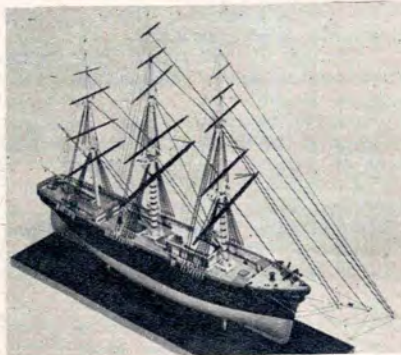
Address of contact man is in the same city as site of event unless otherwise specified.

- ILL—Chicago, Sept. 19. "Waukegan at Chicago, N.W." American Miniature Racing Car Assoc. race. Info from Carl W. Noward, 1384 Berdan Ave., Toledo, Ohio.
- CONN—Hartford, Sept. 19. Greater Hartford air-model team racing contest. C. J. Gallagher, 54 Church St., East Hartford.
- IOWA—Grand Mound, Sept. 19. Rock Island-Moline air-model meet, free flight entries. E. J. Christenson, 808 27th Ave., Moline, Ill.
- OKLA—Tulsa, Sept. 19. Glue Dobbers air-model Nordic towline glider meet. W. H. Kehr, 4940 N. Johnstown.
- CALIF—Sacramento, Calif., Sept. 19. Northern Calif. Free Flight Council air-model meet. John Lenderman, Box 216, French Camp.
- NY—Bayville, L.I., Sept. 25. Screamin' Demons' Long Island Sound air-model hydro championships. D. J. McGovern, 81-53 242nd St., Bellerose Manor, N. Y.
- MD—Baltimore, Sept. 26. Model speed boat races, Patterson Park. Andrew Balling, 910 Cooks Lane.
- IND—State Jubilee model race car meet. See first listing.
- SO CALIF—Oct. 10. F.A.S.T. Club's air-model team races. Keith Storey, 8509 Higuera St., Culver City.
- OHIO—Cleveland, Oct. 10. Model race car meet. See first listing.
- CALIF—Bakersfield, Oct. 10. Gas Modelers air-model record trials. Clinton Merrill, 212 Washington, Oildale.
- MICH—Detroit, Oct. 17. Model race car meet. See first listing.
- CALIF—Sacramento, Oct. 24. Northern Calif. Free Flight Council air-model meet. John Lenderman, Box 216, French Camp.
- OHIO—Akron, Oct. 24. Model race car meet. See first listing.
- OKLA—Tulsa, Oct. 31. Glue Dobbers' air-model radio control meet. W. H. Kehr, 4940 N. Johnstown.

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This complete kit of 6 imported Swiss screw drivers are yours for only \$1.50. They are Swiss imports. Precision made by the famous Swiss Watch toolmakers. Handy and useful for small screws, especially for delicate objects when modeling and other handy crafts. The 6 assorted sizes accommodate practically every type of small screw. Order now.

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Send check or money order with name and address. We pay postage. If C.O.D. you pay postage and C.O.D. charges. Money back guarantee protects you fully. Rush orders today.

**SCOTT MITCHELL HOUSE, INC.**  
611 Broadway, Dept. 209, New York 12, N. Y.

## "SUPERSONIC FUELS"



the champion fuels of the 1953 Nationals—won more first places than any other brands. Accept no substitutes. "100"—\$8.00, Ultra Glo—\$9.00, "1000"—\$1.00 per pint.

## RADIAL MOUNT

**FOR .19 AND .23  
ENGINES**



Rear view of .19 shows mount ring installed. The three mounting holes are the same spacing as mounting bolts on .29 and .32 engines.

**Price \$1.00**

Also available for the .15 at \$.75.

## WHEELS



1"..... \$.15 each 2"..... \$.25 each  
1 1/2"..... .20 each 2 1/2"..... .30 each

The most streamlined wheels available today — low drag, light weight. Solid aluminum hubs can be drilled out to fit larger axle if necessary. Available in four sizes.

## K & B SHUR STOPS

Now available at your dealers, a new redesigned out off valve for the same price—only \$.75.

**K & B MANUFACTURING CO.**

224 East Palmer St., Compton, Calif.  
Nevada 6-4141

(Continued from page 35)

For the benefit of our readers, we list those schools on the roster of the National Home Study Council, an accrediting agency for private home study schools, which offer courses at the technician level covered here. The courses named are representative, and do not necessarily show all the curricula:

Air Conditioning Training Co., Inc., 789 Wick Ave., Youngstown 1, Ohio. Air Conditioning, Refrigeration.

American School, Drexel Ave. at 58th St., Chicago 37, Ill. Air Conditioning, Contracting and Building, Electronics, Mechanical Engineering, Tool Making, etc.

American Technical Society, 850 E. 58th St., Chicago 37, Ill. Air Conditioning, Estimating and Contracting, Diesel Locomotive, etc.

Central Radio & Television Schools, Inc., 17th and Wyandotte St., Kansas City 8, Mo. Electronics, Radio and TV Technology.

Chicago Technical College, 2000 South Michigan Ave., Chicago 16, Ill. Building Construction, Building Estimating, Drafting (Mechanical, Structural, etc.).

De Forest's Training, Inc., 2533 N. Ashland Ave., Chicago 14, Ill. Industrial Electronics, Nuclear Instrumentation, Radio Communications, etc.

Industrial Training Institute, Inc., 2150 Lawrence Ave., Chicago 25, Ill. Air Conditioning, Domestic and Commercial Refrigeration, Electronics, Industrial Electricity, etc.

International Correspondence Schools, Scranton 9, Pa. Air Conditioning, Airplane Drafting, Civil Engineering, Electrical Engineering, Mechanical Engineering, Structural Engineering, Diesel Engines, Ship Drafting, Industrial Instrumentation, etc.

National Radio Institute, 16th and U Sts., N.W., Washington 9, D.C. Electronics, Radio and Television Communications, etc.

National Schools, 4000 S. Figueroa St., Los Angeles 37, Calif. Radio, Television and Electronics, Diesel, Automotive and Allied Mechanics.

Utilities Engineering Institute, 2525 N. Sheffield Ave., Chicago 14, Ill. Air Conditioning, Diesel, Refrigeration, etc.

It might be noted that a number of these schools give regular resident courses—meaning you attend in person—with buildings and equipment for use not only by attending students in the city of location, but in certain cases by correspondence students whose course requires lab or shop practice.

(The cost of your course may include train fare to attend such schools for a limited period.)

It might be stated that a good percentage of the home study schools listed here as offering electronics courses also carry courses in radio and television servicing. RCA Institutes as well has correspondence courses for such servicing (two for those already experienced, with a beginner's course in radio elec-



Long Island A&T Institute

These students in construction technology are laying out lines for new building. Role of Construction Technician increasing fast.

tronics in preparation). Servicing, however, comes under the head of "vocations," not requiring the amount or extent of training as for technicians, and will be covered in a later article.

## Junior Colleges

One of the main functions of the junior college has been to give the freshman and sophomore years of a standard four-year college program, so the student may enter college at the junior-year level. However, in the last few years more and more junior colleges have added to their existing terminal courses—and in technology.

The American Association of Junior Colleges has a roster of about 600 schools. (Though many contain the "junior" part in their titles, others are community colleges and technical institutes of many kinds, both publicly, privately owned.) Of these 600 schools, according to a list prepared by the U.S. Office of Education and published by the Association, 143 now give training for technicians of all kinds—air conditioning, surveying, etc.

The terminal courses taught usually reflect the industrial needs of the section where the college is located. Thus, many of the junior colleges in Southern California train students for the aircraft industries. . . Find out all you can about

Most extension programs offered by universities hold evening sessions too, as do most private tech institutes. Scene above shows activity in electrical lab at Purdue's Calumet center.

Purdue Technical Institute





the "juniors" in your vicinity. Your State Department of Education will help you with information.

### Earn While You Learn

In "cooperative education," as you know, the student alternates his school work with practical job work in a directly related industry. One of the leading schools in the country with a cooperative program is Rochester Institute of Technology—which not only practices it in its regular college course but in its shorter technician courses as well. Covered by the coop plan are mechanical, chemical and electrical technology, each of which requires three years to complete.

Even though the time is longer than for most tech courses, it might be pointed out that a graduate has had practically two years of experience on the job; many graduates stay on with their employers.

The system works as follows. At the end of his first school year, the student in either of the three technical fields mentioned is eligible for cooperative employment. For 12 weeks of that summer he may be employed by one of the industries in the Rochester area with which the Institute has affiliation. During his second school year he may be employed for a minimum of 19 weeks—this on-the-job work being for nine or 10 weeks at a time and alternated with an equal period of classroom work. . . . The same procedure follows for the summer after his second year, and during his third school year.

For all this on-the-job work the student in electrical technology receives total gross earnings of \$3,191.75. His essential school expenses (tuition, fees, books) come to \$1248. Thus he has "made a profit" of \$1943.75 (less payroll deductions)—which the student who comes from outside of Rochester may apply to the cost of his room and board. . . . Among the firms in the Rochester area that have employed R.I.T. students under the cooperative plan during the last five years are General Electric Co., General Motors Corp., Stromberg Carlson Co., New York Central Railroad, American Locomotive Co. and others.

Any information on these technician courses may be had by writing to the Registrar, Rochester Institute of Technology, 65 Plymouth Avenue, South, Rochester 8, N. Y.

In certain cases and in certain sections throughout the country you can obtain technician training by serving as an apprentice in a particular industry or field of endeavor. The U.S. Department of Labor, in conjunction with industry and labor unions, is fostering such a program for skilled workers in general, including a limited number in the semi-professional area. While learning, an apprentice makes about half the wage of a journeyman worker in that particular trade or field.

Along with his on-the-job training, he gets classroom work, usually at local public vocational schools. Average age of apprentices at the start of training is from 17 to 24 years. Time required for indenture—two or more years. (It takes four years to be a tool and die designer under the apprenticeship system.)

To learn about such opportunities in your locality, inquire at your nearest State Employment Service Office, apply directly to industries in your area, or contact the local union representing the trade in which you are interested.

### Photographic Technician

The use of color in photography in the last few years (it doubled between '48 (Continued on page 77)

## BADGER by KENHI



**\$5.95**

**COMPLETELY  
PREFABRICATED  
FOR ENGINES  
19 TO 35**

The sweetest free-flight model ever put in a kit box. Big 6 foot wingspan, more than 850 square inches of lifting area. Long stabilizer moment for that flat, floating glide; short rudder moment for safe flying in any weather. Features the KENHI "Cross-Control", the best spiral dive preventer ever devised. Easy to build, easy to fly, a sure-fire contest winner.

**BUZZER'D  
RADIO CONTROL  
FREE-FLIGHT  
SPORT OR CONTEST  
\$10.95**



KENHI MODEL PRODUCTS ANAHEIM, CALIFORNIA

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MAKES**

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for current catalog.

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SPEEDY  
DELIVERY**

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Davenport, Iowa**

## AUSTIN CRAFT

**FORECASTS  
fine flying  
weather!**

Before you take to the air this Fall take a close look at these Austin-Craft Specials for active modelers . . . Austin-Craft offers more of everything you need. For instance . . .



### A-C PUMPS

Ever-working,  
Never-failing,  
Heavy-plated,  
1/2 pt. or pt.  
ea. 65c  
1/2 pt. or pt.  
with screen  
filter --- 69c  
Quart with  
screen filter 75c



### AIRFLEX WHEELS

2 3/4" Streamlined  
for Free Flight  
and "U" Control.  
Aluminum hub.  
Weight 2 oz. plus,  
per pr. -- \$1.50



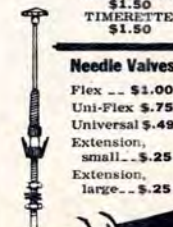
### FUEL-OFF TIMER

1/2 A, A, B, and  
even C Motors!  
Glow Plug and  
Diesel. Wgt. 1/2  
oz. All Metal  
\$1.95  
LARGE TIMER  
\$1.50  
BABY TIMER  
\$1.50  
TIMERETTE  
\$1.50



### A-C BATTERY BOXES

Large, med.,  
Pencil, 40c ea. 4-Pencil,  
3-volt, 60c. 6-volt (for  
radio control, etc.) 75c ea.



### Needle Valves

Flex -- \$1.00 ea.  
Uni-Flex \$.75 ea.  
Universal \$.49 ea.  
Extension,  
small -- \$.25 ea.  
Extension,  
large -- \$.25 ea.



### TINY FLEX NEEDLES

K & B.....\$.35 ea.  
Baby Spitfire .\$.35 ea.  
Wasp and  
McCoy.....\$.35 ea.  
O. K.....\$.40 ea.  
Spitzy, Royal  
Spitfire.....\$.40 ea.



**431 S. VICTORY BLVD.  
BURBANK, CALIF.**



# GREAT SPORT! BOOMERANGS

THE AUSTRALIAN MYSTERY STICK

DEVELOP REAL SKILL  
AND CO-ORDINATION

FLIGHT  
TESTED



**COL. JOHN M. GERRISH**

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## WHAT A OF A DIFFERENCE IN FLYING MODELS



Most flying models may look alike but that's where the similarity ends. Some so-called "flying models" are hardly "flyers" at all. They're so poorly engineered that only the force of oversized engines can keep them aloft—others are true "flyers" and are flight engineered like a full-sized plane. There are many companies making these... one of the better ones however is CONSOLIDATED. Build and Fly a CONSOLIDATED and see what we mean!

### JUMPIN' JACK

Sleek, sturdy, prefabricated. What a performer! 35" spread—23 1/2" fuselage—8" cord. Complete with exploded view drawing & instructions. Only \$2.75 less engine.

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**MODEL ENGINEERING CO.**

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CONSOLIDATED MODELS...  
DESIGNED BETTER—BUILT BETTER—FLY BETTER

### DECALS

Consolidated's famous Decal collection consists of more than 40 attractive designs. All colorful, all authentic, all exciting. Ask for free circular.

# SOMETHING NEW IN BOMBERS

After several more years behind Wood, Iron, Lead and Bamboo Curtains, our OOIA\* spies are back safe but breathless with some real hot photos of latest "poten" (potential enemy) bombers which were smuggled out at the risk of losing their "G" suits. Aircraft identification quiz-whizz readers will recall similar photos in August 1950 and February 1951 AT. As is obvious to the trained aeronautical eye, these craft are composites of U.S. military and civil aircraft, though their foreign "designers" vehemently deny same, claim it to be catapultistic propaganda. Let's see whether you can prove the canard about these tractor designs. (Answers are inverted.)

(\* Office of Incredible Aircraft)



This long-nosed dual-pilot number designated as B-2404617E seems to defy a few standard engineering practices and has total disregard of the C.G. problem. Rearward location of engines makes forward cockpit quite quiet. Good feature?



Versatility is keynote for Lower Slobonia's BC-255524. In time of war it carries bombs; in peacetime, deviationists from party line can be dropped out of the bomb bay; also used as caviar express for diplomatic banquets. Rather slow.

### ANSWERS:

Top—B-2404617E: Front, Convair XB-46 jet bomber; middle, wings and engines, Boeing B-17E; rear fuselage section, Convair 240 airliner. Center—BC-255524: Front, Curtiss C-55, prototype of C-46 Commando; middle, North American B-25 Mitchell; rear, Convair B-24 Liberator. Lower—RBAB1-2032: Front, Douglas A-20 Havoc; middle, Convair B-32 Dominator; rear, Budd RB-1 Conestoga.

RBAB1-2032, attack and reconnaissance bomber. Powered by four 2500 hp engines with non-reversible air crews. Pride and glory of an unidentified country. Rear of fuselage is stainless steel; keeps comrades' nose high in any company.





# New, authentic scale model kits

98c retail



The *Famous* 1912 Mercer

## HSL-1-K Twin Rotor HELICOPTER

\$1.49 retail



### TWO HISTORIC CLASSICS OF ROAD AND TRACK

Authentic, easy-to-assemble models of two famous racers of the early 1900's. Accurately scaled  $\frac{3}{4}$ " to 1 foot. Each model over 9" long, when completed. Illustrated instructions included.

### TWO BELL AIRCRAFT HELICOPTER KITS

Accurate scale models of two of Bell Aircraft's newest. The pontoon rescue craft will actually float. The HSL-1 is the new anti-submarine twin-rotor 'copter produced for the U. S. Navy. Real rubber tires, free-spinning rotors. Illustrated instructions.

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The *Great* 1914 Mercedes

## 47-D-K Pontoon Rescue HELICOPTER

98c retail



## SEE YOUR HOBBY DEALER

SAUNDERS-SWADER TOY COMPANY — 502 RATHBONE AVENUE — AURORA, ILLINOIS

(Continued from page 75)

and '51) has given a new impetus to an industry that was moving up quite rapidly anyway. Just in the last decade or so photography in general has found new applications in science, engineering and industry, with new products constantly developed to further such use. Nor can 60 million cameras recording images all over the U.S. be wrong.

All of which means photographic technicians are wanted. This type works in both photographic labs and in industry. He may be employed in photo-finishing plants, color processing labs, color studios, industrial labs, engineering firms, research foundations. In the industry itself he is employed in sensitometric and photographic testing of film, paper and color materials, in experimental work, in control operations. He may become a foreman and advance up the ladder, be a development engineer. Nor is there any law that says he may not go into business for himself.

What's a course for photographic technician like? Let's take a look at the one taught at the Rochester Institute of Technology. (It has eight different courses in photography. The one for photo technician, like its other three technician courses mentioned, is accredited fully by the Engineers Council for Professional Development.) Time required: two years. As in the other photography courses, the first year includes photography fundamentals, such as printing, design, photographic physics. In the second year the student gets sociology, economics and English in addition to photographic chemistry and photographic optics. Majoring in photo technology in that second year, he has two color courses, one in advanced photographic sensitometry, quantitative analysis, and photographic technical analysis.

Highly specialized technicians are as well paid as photographers. The starting salary is around \$3500 per year. This by no means indicates the high earning possibilities.

In the second part of this survey next month, we will furnish details—training, pay, job opportunities—on technicians in the fields of aeronautical engineering, architecture and building construction, electrical power, civil engineering; heating, air conditioning and refrigeration; instrumentation; and automotive, diesel and steam technology, as well as in industrial technology and in chemistry.

## By Proportion

(Continued from page 23)

he did whatever he could. Parts from earlier ships were put to good use, and finally, almost complete but lacking good rotors and an engine, a 100-horsepower Franklin engine was bought, and a set of war-surplus Platt-LePage rotors. Armed with these, he set about with renewed determination, and in the spring of 1948 he trucked his completed helicopter to a nearby field.

Now the craft had to be test flown, and lacking the funds needed to hire a test pilot, Exel set about to do the job himself. "I had spoken to helicopter pilots and had read up on how to fly one," he said, "so I had a pretty good idea as to what I had to do; it wasn't anything."

His program of "feeling out" his brainchild began. Running the rotors slowly at first to feel the reaction of the controls, and then a little more power and a little more speed, until he felt that

he had control of the ship. Then the first take-off, hovering over the place where he left the ground. Master of his machine, but still wary of it, he made more flights, forward, sideways, up, down, until he was satisfied, not only with the performance but also with his own ability to fly the craft. Today, Exel is an accomplished helicopter pilot.

The fuselage of the EXEL-i-copter is built on the main frame of his 1932 job inverted. The shafting is from his tri-axial helicopter, and scattered throughout the ship are over 20 parts from 12 different automobiles! Exel says that he worked along on this ship, making whatever was needed at the time, and keeping the parts "in proportion." His original intention was to leave the fuselage uncovered, but he started to cover it one day and did not quit until it was completely done. No drawings were ever made, and the fore part of the fuselage was made on his workshop floor without measurements, with just the eye to true up the parts. All the constructional processes such as riveting, welding, the sheet metal work, were done by Exel. The craft was looked over at one time by some engineers, who were surprised at its professional appearance and performance.

Presently, Exel is engaged by the Quantum Research Company in the development of small ram- and pulse-jet engines for tip mounting on helicopters. But on his time off, George Exel still gets pleasure in flying the EXEL-i-copter, the dream that finally came true. He is typical of many of our backyard experimenters, including the Wrights, Curtiss, and so many others of the early aviation pioneers, whose ambitions and determined abilities guaranteed a solid foundation for our present aeronautical knowledge.



**Nothing BEATS A HOBBY!**

**3 New OPERATING MODELS by Ideal Models**

**EASY-FORM HULL CONSTRUCTION**  
Length 18" Beam 7"

**AQUA-KING CRUISER**  
No. 1535  
3.95 WITHOUT MOTOR  
Completely prefabricated Easy-to-assemble. Preformed sides and bottom.

**SPEED DEMON RACER**  
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1.95 WITHOUT MOTOR  
Beam 6" Length 15"  
Completely prefabricated plywood and balsa parts. Easy-Form Hull construction.

**SAIL KING**  
No. 1533  
5.95  
To meet the demand for a larger sailboat, we present the "Sail King" designed by Tex Foster (Model Yacht Authority). Each part prefabricated.

**SEE YOUR HOBBY DEALER NOW!**  
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Demand for our engineering graduates exceeds supply. Effective placement! Study in this world-famed college founded 1884. Quarters start Jan., March, June, Sept. Approved for Korean Vets.

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Personalized practical instruction. Wind tunnel, structural and dynamometer testing included. Also degrees in Mech., Civil, Elec., Chem., Radio (TV), Adm. Engineering; Bus. Adm., Acct. Extensive beautiful campus. Modern buildings and well equipped labs. Mature students. Prep courses. Modest costs. Mail coupon now to Jean McCarthy, Director Admissions, for Catalog and View Book.



## TRI-STATE COLLEGE

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Please send me your catalog with full information on Aeronautical Engineering and other courses. I am especially interested in courses checked:

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Name.....

Street Address.....

City..... Zone..... State.....

## Hobby-Model World

(Continued from page 10)

Wakefield contenders who were in action on this second day, once again encountered the remarkable thermal activity associated with the sandy terrain of eastern Long Island.

A victory dinner climaxed the F.A.I. Gas-Wakefield "Olympics" in Riverhead, L. I.

**Will Free Flight Last?** That's the question Harry Crum put to us. In fact, his brief query stated: "I am about to choose a certain branch of model building. Some fellows from our local club—control line fans—think that free flight is dying and slowly going out of the picture. I like free flight for contest work, but I am a little skeptical as to whether free flight will last. I would like to have your opinion on this." Harry is from Hagerstown, Md., where there are a lot of hot-shot U/C fans.

Well, Harry, maybe you've got more of what is commonly described as "the wide open spaces" around Hagerstown, so a fellow can decide whether or not he wants to go in for free flight jobs. But in most of the spots around the country we hear from regularly, the modeler doesn't get to decide—the decision is already made for him on account there just aren't many good fields left from which to operate. In other words, it's becoming increasingly more difficult to find decent free flight areas near sizeable communities. Take Los Angeles, Boston, Toronto, Washington, D. C.—you name it—and we can introduce you to scores of modelers in each locality who'll tell you the same thing: just no place to fly unless you want to travel miles and miles.

Who's the culprit? Who's responsible? Well, you, Harry—you and your fellow 160,000,000 plus Americans. The expanding suburban areas and the unprecedented movement of industry away from the cities have combined to gobble up your free flight areas.

What does the future hold for free flight—you want to know? Things will get worse before they get better—but do you know what can improve the picture? Small, lightweight radio control free flights, inexpensive to build and equip, inexpensive and foolproof to operate.

Until we have them, though, it's march, march, march farther out into the country for the foot-weary free fliers.

**All Is Not Lost!** Referring to the preceding paragraph of gloom, we are happy to report that there's good news from one city, at least—Jacksonville, Fla. C. T. Hampson, secretary of the Flying Rebels M.A.C., says the group has a new flying site, one of the best in that section, through the cooperation of the U.S. Navy. That service has granted the Flying Rebels permission to run off free flight and radio control contests at the Whitehouse, Fla., auxiliary air field, 14 miles outside of Jacksonville. Features: eight—count 'em!—3,500 foot runways in an octagonal pattern, almost two miles to the nearest tree, no swamps in the area (in Florida this is something you are concerned about), and—best of all—no radio interference in the area.

The radio control branch of the FR-MAC got things off to a good start with a 2-day Labor Day weekend R/C contest; unfortunately, notice of this came much too late to catch our previous issue where it would have done more good.

Now, here's a thought for all you Harry Crums across the country looking for a free flight site. If there's a military

air field in your area, why not contact its public information officer to determine if perhaps there might not be an auxiliary field open for model flying? Both the Air Force and Navy have endorsed air-modeling from the Washington end; maybe you can stir up some action on the grass roots level.

**Tips For Teachers.** School personnel interested in aviation and in bringing it into their classroom work will find "Aviation in School and Community" a helpful little book, recounting as it does how various communities and school systems have succeeded in introducing air-age programs to students. But what amazes us is that you've got to go through this book with a fine-tooth comb to locate any of the very few references to model airplanes. Apparently the American Council on Education which produced this book in cooperation with the Civil Aeronautics Administration has yet to realize that one model is worth a thousand words when it comes to the study of airplanes in particular and aviation in general.

**Old Timer Heard From.** Herb Greenburg, former New York City model whiz back in the days of the twin-pusher and Superfine indoor model, reports in. Three years ago Herb got his amateur radio license, W2CTD, ever since then he's been meaning to get into radio control, finally decided to reproduce the Mac II transmitter. Herb's address, for the benefit of the Old Timers League, is 51 W. Cedar St., Livingston, N. J.

### Watch Those Overhead Wires!

When you're flying control line models keep away from any wires, whether you think them power, phone or telegraph. We keep talking about safety precautions, you notice? We don't continually harp on that theme just to fill space; we're trying to save lives.

Ed Breland knows what we're talking about. Ed's with radio station WAML in Laurel, Mississippi. Writes Ed: "I am enclosing an item from our Associated Press wire service . . . that tragically bears out the hazards of such carelessness in control line flying as your magazine has long stated. This is the second death in our state in something like a year and a half from the same cause. The other happened in Columbia, Miss., and was mentioned in your magazine shortly after it happened. I hope you can use the enclosed information to some advantage in pointing up the seriousness of flying control line models safely. . . ."

Ed's enclosure was a news item reading: "Jackson, Miss.—A 45-year-old Jackson laundry worker was electrocuted when the control wire of a model airplane hit a power line in a public park. A fire department crew worked on him for more than 30 minutes in an attempt to revive him."

Point of all this is to remind you to not fly control models near any wires—ever! If you want to electrocute yourself please don't do it while flying a model airplane. Gives the sport a bad name and is entirely unnecessary. Like that rare bird that commits suicide in an airplane by diving into the ground—why give aviation a bad name?

**New Clubs.** Sky High Flying Club of Breckenridge, Colo. President is Larry Madron; secretary is Leroy Dodge at Box 297. Hancock, Mich., Admirals Modeling Society shortens to "H.A.M.S."—the club emblem—you guessed it, a nice big ham. Chuck Robertson, 820 Quincy St., says the group would welcome out-

(Continued on page 80)



## STANCO MANUFACTURERS R.C. ACCESSORIES

STANCO MECHANICAL PROPORTIONAL CONTROL UNIT completely assembled, ready for use.....\$25.00

NEW! A KIT for the above unit with all parts completely fabricated, ready to assemble. Consisting of sturdy metal case, heavy chassis plate and mounting brackets, proportional reel, carbon brush motor, jacks, switch assembly drawing, etc. 16.50

NEW! A KIT for the Stanco Control Unit with all parts fabricated except mounting brackets, chassis plate and rods which require machining plus detailed and assembly drawings. 12.50

PROPORTIONAL REELS (split drum type) includes detailed and assembly for building the Stanco Proportional Unit 4.95

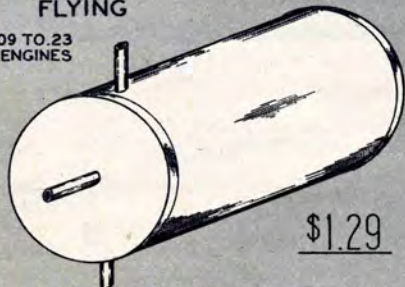
DETAILED AND ASSEMBLY DRAWINGS to build the Stanco Proportional Unit....50

### STANCO MANUFACTURERS

120 East 6th Street Clifton, N. J.

### R/C AND CONTROL LINE FLYING

09 TO 23  
ENGINES



\$1.29

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THE TANK WITH THE "INTERNAL SWIVEL"  
SIMPLE TO USE A Product of the  
DEPENDABLE J-BOLT MODEL ENG. CO.

Another  
**PERFECT  
Exclusive!**

\*Self-Lok



The  
Completely NEW  
**WHEEL...**

This New advanced design has no protrusions of any kind. It's 1 1/2" dia tires and larger are factory pressurized and sealed to remain permanently pneumatic....

**PERFECT  
PARTS CO.**

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BALTIMORE 2,  
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HERE'S WHAT YOU'VE BEEN WAITING FOR

**NYLON** ORANGE 115  
WHITE PER YD.

Light weight, strong, ideal for  
all types of planes 36" width

**SILK** ORANGE 95¢  
RED PER YD.  
YELLOW  
WHITE

36" WIDTH

Please send cash, check or  
money order. Sorry, no C.O.D.

### MODEL COVERING CO.

P. O. BOX 21, RUGBY STA.  
BROOKLYN 3, N. Y.

MONEY BACK GUARANTEE

# Trick Pix

By Allan Cloy  
Burbank, Calif.



Pete the Pitcher all set for the World's Series. His body is a bat, (hat on top), two paper cups form eyes, the hand's a mitt; shoes help him stand upright.

By Gifford Millard  
Columbus, Ohio



Pigs is pigs, or are they? In this instance they happen to be a quartet of bananas disguised as porkers. The "trough" is an orange. (Come, boys, no crowding now!)

## CASH IN WITH YOUR CAMERA

### HOW TO WIN "TRICK-PIX" CASH

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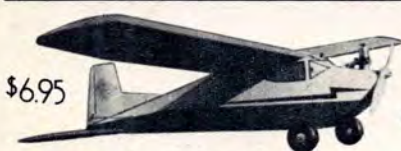
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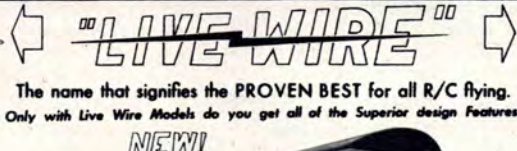
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**THE "CLIPPER"**



**THE "KITTEN"**

(Continued from page 78)  
side correspondence. Chuck personally is looking for a pen pal interested in model boats or cars.

**Potato Racers?** At first we thought Arthur Kampen was telling us about a new type of water craft, "Spudboats"—but it turned out he was talking about speedboats, Half-A powered ones. He and a partner want to get a boat club under way out in St. Louis. Art's address is 2751A Lafayette. And it's, St. Louis, Mo.

**North-Western Roundup.** Our contest calendar has been carrying regular notices of the Northern California Free Flight Council's competitions, but June Dyer says we haven't been saying much about the results. So here's dope on the 3rd contest of the NCFFC held at Mathers Field. The day was mildly warm for Sacramento, June reported, with a slight high wind that carried the planes out of sight a little too fast. Many entries were lost and chasing them across the dry fields was no picnic. The Northern California Free Lancers Club took charge of the meet with William White, Sr., officiating as head man. Mr. White had a good timing system: he held two stacks of flight cards. Fellows offering to "time" were given the first chances to fly. If a "flying timer" was not ready to go, then the next regular flight card was selected. It worked out with the ones willing to time getting all the flights in they wanted. Under NCFFC rules, a club member is not permitted to time a fellow club member and care is taken at the recording table to see that this rule is not broken at any time.

Directly after saying all this, June wrote: "No eighteen minute totals were recorded."

We know she meant "because of the weather conditions," not because club members were prevented from timing one another! (Stand back, men, that was a joke. . . .)

Anyway, to the contest and its results. Tom Moore of the Elmhurst Prop Busters won the Granat Brothers' high time perpetual trophy with a Class B original called "Percentage Job." Tom used a Torp .29 and racked up a total of 17 minutes, 49 seconds. Since Tom was one of the guiding lights behind the organization of the NCFFC and has worked hard to make it succeed his victory was what you would term a popular one. Prop Busters won other first places—Robert Beach was first in Class C with 14:16.5 and Junior high time was won by Frank Mason in Half-A with 12:49. The San Francisco Vultures took their share of the awards. Bill Gunther captured Half-A with 15:19.9 and also Half-A PAA-Load with a flat six minutes. Robert Nash placed second in Class A with 13:46 and Bob Risvold, third, with 13:42.

Sam Kadlecik of the San Francisco Gulls won Class A with 14:02.6. Bill Bowen of Lodi took the A-B PAA-Load event with 7:26.3. Other well-known contestants—among top placers were Al Grenoble, John (F.A.I.) Tatone, William White, Jr. (National Champ), and his brother Joe White, Jr.

**Refinements in PAA-Load Endurance?** Dick Hoover of Amagansett, Long Island, has a few he'd like you to think over. Says he hasn't had an opportunity to work them out in detail, but maybe a few suggestions will start the ball rolling. Dick's in the Navy and just moved to Amagansett from Jackson, Mich. "The event might be improved by limiting the size, or rather the wing area

to—say—500 square inches or less in order to keep the planes to a size that is practical and by figuring the wing loading." This is Dick talking.

"Another thing would be limiting the take off run to—say—half a lap and clearing an obstacle 12 or 18 inches high. Points might also be score on the speed of the plane.

"In this way, a person would have to pay more attention to the design of the plane in order to get the maximum points. I haven't thought it out thoroughly, but I believe that some method could be worked out so that all these factors could be multiplied together into a point total and no one feature would be the big factor.

"It might shape up this way. Model A, 500 square inches, carries 20 ounces, attains a speed of 70 mph. The wing loading is .04 ounce per square inch (payload only). Total points are 280 (wing loading in 1/100 oz. per sq. in. multiplied by speed). Model B, 400 square inches, carries 20 ounces, attains a speed of 60 mph. The wing loading is .05 ounce per square inch. Total points are 300.

"Now this is just a theoretical case, but it serves to explain my view. Even though Model A traveled faster it lost because Model B carried more weight—or rather, payload. With rules of this sort, you would have to have a good lifting airfoil of low drag, a 'clean' ship and a hot engine. Oh, yes, I neglected to say the engines would also be limited to maybe .29 cu. in.

"By having a limited take off run, and clearing an obstacle it would simulate full scale aircraft problems."

Dick didn't mention endurance at all. Maybe he'd require entries to fly for a specified length of time.

—The Dopester



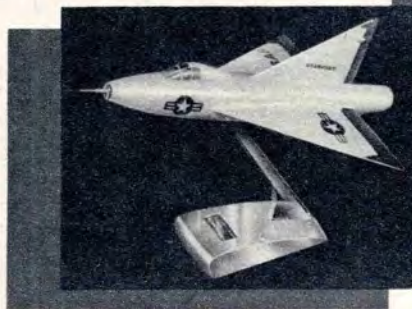


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## WESTERN ROUND UP

The Los Angeles PAA contest run by the Long Beach Thunderbugs brought forth some very interesting facts: one—the amazing amount of power that is stored in those diesels; two—that modelers will go to any length to win contests.

In the first instance Louie Culler's Cargo Clipper lifted an amazing 27 3/4 ounces officially, on another flight 31 1/2 ounces for 1:39 on a 2 1/2 second run. Louie's ship was trimmed in a manner which was very unusual for its type. The take-off run was very short for such a load, lying over in a tight circle immediately after take-off; this tight circle increased flight speed, putting much more lift in the wings for a very high climb approximately 50 feet higher than second place, Bob Moncrieff, who lifted 25 1/2 ounces. After the power run the ship rolled out to a much larger circle, actually gaining altitude on this change-over; the glide was fast and flat as can be seen from the flight times.

Both Bob and Louie flew ships of identical design except for flight trim. Bob's ship climbed straight and had very little turn in the glide. These models were of all balsa fuselage construction, pylon cabins, sheeted wings and tail leading edges and were built of very selected wood, covered with Jap tissue; weight without loads was 9 to 10 ounces. The cargo was carried in small cargo boxes of 1/8" plywood, being built so that 1/4x1x2 1/2" inch strips of balsa or like-size chunks of lead could be easily inserted, the boxes very easily removed with loops of heavy twine.

The pair worked together building these ships, having about 3 lbs. of these lead slugs at the contest. The good natured bickering between the two contestants produced lots of laughs when

## What's in the Name . . . Kelly Air Force Base? (San Antonio, Tex.)



was possible to obtain a commission from the ranks. Following a tour of duty in the Philippines, China and England with the 30th Infantry, Lt. Kelly was assigned to the 1911 Aviation Meet at Selfridge Field where, according to records, "he made an ascent with Walter Brookins and took photos." Then he received flight instruction from Glenn H. Curtiss. His pioneering career was cut short, however, for on May 11, 1911, Kelly died in a crash at Fort Sam Houston, Texas. He was buried in the National Cemetery at San Antonio near the vast installation which bears his name.

More short articles on "the reason why" in connection with naming of air bases will appear in future issues of "ATH."

each was accusing the other of hogging the lead so he could beat the other. Actually, even though they had 3 lbs. of lead, it almost was not enough for each one to fly at the same time.

On the other side of the ledger, modelers will go to any length to win contests. One very zealous competitor who had two sixes in a row with his Class A job found a new way to void flights. On his third flight which incidentally was only 50-some seconds, his ship tipped the prop during take-off. Thinking real hard he managed to protect his own flight, saying his model had dropped parts while in flight. In closely examining the present rules it was found that since timing starts the instant the model is released and an official flight is more than 40 seconds, this could be a flight and parts could have been dropped.

The contest director was more or less on the spot since he was a good friend of the contestant. Should he allow the attempt to be made over, risking the chance that the flight would be good and having the other contestants on his back? Or should he say no and have the other guy mad? Well, he allowed the flight to be made under protest and it was a good thing he did, for another maximum resulted, then a 4th flight which broke the records. The C/D then proceeded to hold up all prizes in this event, wrote up the proceedings to the contest board and let them decide.

We think this was real shrewd, for it will establish once and for all whether or not this sort of thing is legal, because the ramifications can surely be rough. Can't you see model builders hiding broken props on good flights or rushing up with a broken tip on poor flights, modelers madly protesting other guys' flights over broken tips and on and on and on? What



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say, contest board?

The Flightmasters ROW contest found eight records being beaten. In for records at this time are Harry Gould, Class C open with 16:05; Sal Taibi, A open, 14:05; Duane Eisenbeiss, B Senior, 15:23; Richard Epstein, A Senior, 12:29.9; Don Zink, 1/2 A Senior, 10:59; Fudo Takagi, Open Limited Rubber, 3:30.8; Bill Spawr, B Junior, 2:53.9, and Bob Patchin, Jr. Limited Rubber, 1:56.3.

Most were using the single-front float and two rear floats; most ships were converted free flights and almost without exception had very little difficulty in getting off. The take-off areas were the small lakes in the infield of Vessel's race tracks and are proving ideal due to the very large number of thermals present. It could be safely said that if all events were ever entered at this spot, that all records would be sure to fall.

Air car speeds are climbing, with Mark Tackett claiming a new record of almost 57 mph with his diesel job. Whether he can duplicate this will be seen in the near future when the next contest is held in Pomona.

A very familiar sight at all contests in the Los Angeles area is Alberto Vela, late of Mexico, who is falling under the influence of Gilliam's designs (with a Vela touch!)—very interesting.

A recent visit to Gus Briegleb's El Mirage proved just why this spot is such a soaring paradise. All kinds of ships available, instructors at your beck and call, school for all those who really want to learn and thermals like you have never seen. Einer Enevoldson was one of the instructors; seems like Einer got his draft notice so he quit school to live it up before getting called up.

We went up with him, this being the first time in years that we were in a sailplane. The ship was one of those famous Pratt Reads. Tow was released at around 4000 feet and we wound in the 1700 ft./min. lift till we were soon up over 8000 feet. From then on a patient Einer instructed this beginner in the fine art of sailplane flying. Peace on earth is nothing compared to this peace in the air over El Mirage. The finest flying in the world.

Gus even allowed us to go up in the tow plane to practice "shooting" these gliders in the air; it was quite an experience and we got some fine pictures. Any of you guys who have half a chance and can make it—Gus has the ships and guarantees the thermals. On the same day Paul Bikle in his modified Schweizer car-towed on a seeming bad day into Arizona, some 240-plus miles away, in constant touch with his crew by two-way radio; he even directed them as to traffic conditions on the road they were traveling.

**Race Cars.** We took in a meet for race cars in Ontario sponsored and run by the Valley Miniature Race Car Association. They have a fast track, well conditioned and protected, in John Galvin Park.

All facilities are available, a large pit area with metal-topped work benches, which is fenced in to keep the wandering public out. Bleachers are provided for those who want to sit and watch; the timing booth which houses the electric clock is provided with a PA system that can be clearly heard above those whizzing cars. Another necessary piece of equipment is an electric starter at the entrance to the track so that last-minute checks can be made by the contestants.

This track is one of the very oldest where guys like Dick McCoy, Woody Woodward and Ira Hassel all sharpened

their spurs. Certainly Dick McCoy needs no introduction. Woody is the fellow who teamed up with Allen and Ketchens when they were tops in the country in speed flying, and is well known as the first to break the 100 mph some years ago. Ira and his engines are all well known. There have been numerous other speed merchants who got a real start on this VMRC track.

The Terra family, consisting of Al, Bill and Donna, are the ones to beat when they are out; they have Arrows for the manufactured class and those very fast 1-2-3-4 for the custom class, all powered with Doolings which have been hard-chromed. The back end of their Cadillac is loaded with these fine cars. Donna is quite an attractive sight by herself and one can't help but admire the very business-like way she goes about preparing her cars for a run, pushing them off herself, too. She gives no quarter and expects none.

Another guy having quite a time that day was Vince De Matteo, who has been in the racket 18 years. Vince and Vince Jr. fought their Dooling customs the entire day, only to come out on the long end when they finally clocked some very fast times. Vince also runs midgits, so you see he is quite a racing man.

**R/C.** The scheduled Catalina Channel crossing by R. L. Brown failed to come off as scheduled, due to one misfortune after another, but things are now beginning to shape up to indicate it might happen after all. The 3-channel Babcock and the two Cameron .15's work together fine with the the Bonner Servo.

Lots of talk floating around for an R/C Boat Nationals. What with all the interest there is, this does not seem far fetched—all that is needed is the organizing and sponsoring. It could be a big event.

—Dick Everett

## SOUTHERN SCENES

The 3-day Greater Southeastern Model Airplane Meet in cooperation with the U.S. Navy and sponsored by the Atlanta Jr. Chamber of Commerce was held at the U.S. Naval Air Station near Atlanta, Ga. With the outstanding help and facilities of the Navy, the meet this year was a bang-up success. Contestants from all over the Southeast and as far north as Ohio attended the three-day affair.

This year new events were set up for freshmen flyers. A special control line stunt and hand launch glider event was included in the list. These and some junior events were held on Friday in order that the older flyers would have time to help the younger boys. This was the first time that freshmen events were held at the Southeasterns. Dick Davis, brother of well-known Tommy Davis of Atlanta, emerged winner of the Herman Short "Best Beginners" trophy.

Special awards went to: Hill Hutchins, Spartanburg, S. C., Testors Best Finish Plaque; Caroline Gardiner, Maxwell A.F.B., Ala., "Best Girl Flyer"; Jerry Stebbins, Biloxi, Miss., Rickenbacker Sportsmanship Award; R. H. Elliott, Atlanta, Ga., Lockheed Aircraft Corp. Service to Modelers in the Southeast; Francis Strickland, Stone Mountain, Ga., Herman Short Beginners Replica, 1953; H. C. Gauger, West Palm Beach, Fla., Lander Motors Best F/F Time; William Woodall, Albany, Ga., Jim Walker Radio Control Race Trophy; Billy Ezell, Spartanburg, S. C., Arthur Godfrey Replica 1953; George Perryman, Decatur, Ga., Arthur Godfrey Perpetual Trophy for Rubber and Glider. And also:

(Continued on page 91)



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## Everything Under Control

(Continued from page 17)

relays at the receiver end—top man was Dean Kenny, with 162 points. Colby Evett was second with 153, and Howard Bonner third with 116. Top in Single Channel was the team of George Bigler and Pat Regan, with 95 points; Ray Downs had 70 and Dick Austin 68.

Wide separation between the two classes seemed to show definite need for such a class split. Robert Merritt of the Aerial Robots, who is only 13, controlled his Flying Ohm like a veteran and called maneuvers better than a lot of the old timers. R. L. Brown (129 N. Oak St., Chino, Calif.), who sent these results, suggests that R/C flyers study the AMA rules carefully and practice calling off maneuvers before entering a contest; as he states, all too often a flyer will enter competition without having much idea what he is going to do, and when he runs out of ideas, is apt to ask the judges, "What's next?"

A few notes have come in from the D.C.R.C. club (District of Columbia); Sec. Herb Honecker (8105 Tahona Dr., Silver Spring, Md.) says they are undergoing the normal run of summer flying, with their full share of hard landings. Several multi-control systems have been under test, including a couple that give simultaneous proportional control for rudder and elevator. Bob Trainer had one of these, and another was being flown by Dr. Good in his WAG; the latter was being groomed for the Nats, but battery failure resulted in a straight-down dive into a barbed wire fence.

At last reports, Walt was working frantically to get his old Rudder Bug in shape for the big meet. Herb notes that Jim Martin has had to leave town for business reasons; he is badly missed, but at least now a few other club members may have a chance at winning contests! A recent club contest was won by Martin in the Expert class, followed by Don Clark. Leo Miller took the Novice class top prize. Many members are getting away from 27 1/4 mc, with 465, 220 and 50 mc. all in use.

A copy of the Dunn Dispatch, sent to us by Charlie Jernigan (410 N. Orange, Dunn, N. C.) features a front-page story of R/C flying in the area. There is a picture of Robert Strickland holding his plane, and another of an R/C transmitter—a Mac II, we are pleased to report, and made by Callbie Wood, Jr. Apparently the flying takes place at the Dunn Airport, and the story mentions Vaughan Huttaff, Howard Hodges, Keith Finch and Harvey Eldredge as participants. Charlie doesn't say whether he flies R/C or not, but he is a model builder.

Paul Runge (Box 301, Higginsville, Mo.) writes that all sorts of unusual R/C projects are in the works out his way. He is working on an Everglades Swamp Buggy of 18" length, to be driven by a Thermal Hopper with air prop; it will carry a Mini-Mac receiver and a Multi-Servo for the air rudder. Next on the schedule is a 15" Show Boat paddle wheeler, which will probably use proportional control.

Paul also is well along on what he calls a "Mini Biplane," with 26" span. He has sold his interest in the Sport and Hobby Shop, and will devote full time to radio control; he notes that reports of trouble with the two-tube version of the Mini-Mac, which he schemed out, can almost invariably be traced to two problems—either the builder doesn't get the

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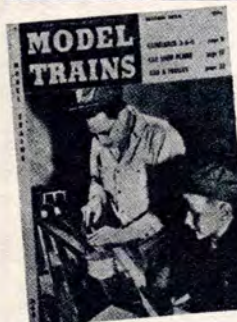
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first tube working just as it should in the single tube Mini-Mac, or, the B battery is not hooked up as shown on the diagrams. The battery hookup is unconventional, but must be followed *exactly*, if any results at all are to be had. As Paul notes, "A guy with little or no hard tube experience has simply got to change his way of living," after being used to working with gas tubes.

The old diesel and biplane enthusiasts — Norm Davis (Dansville, N. Y.) — says he is still going strong. He is now at work on another copy of his "June Bug" biplane design — this one being beefed up for radio use, and having a wider fuselage; span is 48". He will fit it with a Fenners-Pike servo, with engine speed variation as the second control.

Seems that Jerry McGeorge and Tony Grish had an unwritten rule that if things were not working too well, only enough fuel for a 3-minute motor run would be put in a plane; looks like Tony violated said rule, for he recently lost a Live Wire Senior on a flyaway. Jerry has a twin hard tuber working, and finds, as we do, that the little Direction Finder we described in this magazine some months ago is most handy for receiver testing.

**Technical Topics.** Dale Root (6036 Telegraph Ave., Oakland, Calif.) tells of a relay checker he has built with the help of Jim Smith which is invaluable for club use. They simply connected an old 45 V battery, a meter jack such as used in their models, a 2000 ohm variable resistor and a pair of clip leads in series. To use the tester, the clips are connected to the relay, the regular tester meter plugged in the jack, and relay settings checked without even turning the receiver on. In this connection, we recently installed a miniature 10K variable right in

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the little case which holds our plane test meter; when range or tuning is being checked, a twist of this resistor shows just where the relay will operate and release. We first heard of this idea from John Worth, and it sure pays off in convenience.

Back to Dale's doings—he says he has taken the Babcock 3 channel rig out of his "Big Freak," and installed the single channel Babcock outfit in same. The change lowered wing loading from 24 to 18 oz. per sq. foot; with the higher loading, the plane flew well, but was too loggy for any hot maneuvers. It is much more frisky at the 18 oz. figure, and Dale expects to build a new wing of 5 sq. feet area, so the multi-control rig can go back in, while still retaining the lower loading figure. A shot of this plane appeared in the Sept. issue of ATH.

**Commercial Items.** Interesting to note that all sizes of Fox engines may now be had with twin needle valves. Made by Fox Mfg. Co. (7401 Varna Ave., North Hollywood, Calif.), engines range in size from a .19 to a .59; latter engine, incidentally, is supplied to Government with twin needles for use in an R/C target plane.

A very wide range of sub-miniature electrolytic condensers is being marketed by Barco, Inc. (Box 1222, Milwaukee 1, Wis.) at low prices. Some of them are smaller than a half watt carbon resistor, yet may have several microfarads of capacity. It is expected that these condensers will eventually be widely distributed through mail order electronics suppliers, and probably by R/C supply concerns as well. Until such distribution is worked out, Barco will supply hobbyists direct from above address; write for list of sizes (Continued on page 87)

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## "My Favorite Model"



### FOLKERTS RACER

Says Walt Musciano

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This veteran of over one hundred flights and four engine changes is still in good condition. The clean lines, totally enclosed engine and absence of wires or struts make it a pleasure to fly and own. The long tail moment arm eliminates any control sensitivity that would normally be caused by the high speeds.

Construction is all balsa with a sheet covered wing and a solid sheet balsa empennage. The fuselage is made with a basic 1/4" sheet balsa side and bottom and uses a balsa block top and nose. Engines were all beam mounted on 3/8" x 1/2" hardwood. The midwing location allowed me to run the flight lines through the wing thereby increasing the appearance and performance.

Much care was taken with the finish to insure good looks and high speeds through the reduction of skin friction. Care was also taken to fair the spinner into the nose block. I kept applying sanding sealer until a glass-like finish was obtained, then the craft was painted lemon yellow and rubbed vigorously. This was well worth the effort in both performance and maintenance. It seems that the fuel will seep into a poorly finished model and weaken it considerably. This could not happen with my Folkerts.

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Signed.....(ATH54)

(Continued from page 85)

and prices.

Ecco multi-control products are now marketed by Ectron Products Co. (Box 393, Smyrna, Ga.). The line includes Multitrol escapement, giving rudder and elevator from a single unit on one R/C channel, and two types of control boxes. With a simple rotary switch controller, Multitrol sells for \$14.95. With a stick type control unit, which is driven by a compact clockwork mechanism, cost including escapement is \$26.95; this control unit is in steel case  $2\frac{3}{4} \times 3\frac{1}{2} \times 2\frac{3}{4}$ ", has a single control stick to operate rudder, elevator and engine speed, and motor will run for 15 minutes (can be rewound during flight, of course). Another new product is an aluminum and fiber battery box in two sizes, for four pencils or four mediums; prices are \$1.00 and \$1.25.

Several new items to be had from Electronic Specialty Supply Co. (58 Walker St., New York 13, N.Y.). A miniature power pack that delivers 180V at 40 ma. will be sold for \$19.95. This unit has built-in charging systems for use on either 110V AC or 6V car battery. Complete outfit, including 2 V storage cell is in case  $4 \times 5 \times 3$ " high. ESSCO has a conversion unit for changing the standard Mini-Mac receiver to the two-tube version worked up by Ace Radio Control; it's called the "Piggy-Back Mini-Mac," and in finished ready-to-use form, sells for \$19.95, with any relay listing for \$6.00. Price less relay is \$13.95, and the kit sells for \$10.95.

Another R/C book published in England has much of interest to American R/C builders. Titled "Radio Control of Models," it is by G. Sommerhof; this is an entirely different book from "Radio Control of Model Aircraft" by same author, and will be sold in this country for \$2.50 by Gull Model Airplane Co. (10 East Overlea Ave., Baltimore 6, Md.). Same concern carries other English R/C books mentioned recently here. The new Sommerhof volume is paper-covered, has 70 pages, and contains somewhat more advanced information than earlier book by same writer. There is no constructional data, but many circuits of receivers and control elements, and quite a few layouts for complete control systems.

The surplus market sometimes offers R/Cers a chance to purchase items they would never be able to afford or locate otherwise, which is why we often list such items here, feeling that they are worth the space, even though they might be sold out by the time late readers of the magazine get around to ordering.

Two such items are currently available from Columbia Electronic Sales (2251 West Washington Blvd., Los Angeles 18, Calif.); both are brand new Sigmarelays. One is somewhat similar to a Sigma Series 5, but has one set of SPDT contacts and another set of SPST. Coil resistance of this one is 16,000 ohms and it sells for \$2.99. The other is a Sigma 7JO—a polarized unit with SPDT contacts and 5000 ohm coil, selling for \$1.99. Both units come sealed in cans but are easy to open up; the 16K job weighs 2.9 oz. when uncased, and the 5K polarized relay  $4\frac{1}{2}$  oz., when opened. Both will work on extremely small current, and current change.

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**STUKA STUNT** model by Don Still. This is the remarkable scale-like stunter. Spans 47 inches; fuselage is 31 inches long. For Fox .29 engine or equivalent.

**DOUGLAS B-26 INVADER** twin-engine control line flying scale by Lt. Dick Atkins, Jr., USAF. This beautiful ship spans 52 inches; has 35 inch fuselage. Power is two K&B .29's or equal.

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action may be obtained. This is required for pulsing or rapid switching control systems where fluttery or weak action would result in skipping or erratic control system operation.

The range between pull-in and drop-out should be adjusted as close as practical for the relay type involved. A close adjustment puts the operating points well within the range of receiver current change so that fluctuations of current are not likely to affect the relay. The adjustment values previously covered are considered minimum for satisfactory operation, but, depending upon the type relay, a finer adjustment may be possible. The Sigma 4F or 5F, for example, may be adjusted so that the pull-in and drop-out values are only .1 ma apart. Some relays, such as the Kurman and Neomatic, are not easily set so close and a good adjustment is likely to be with the operating points .2 to .3 ma apart. This is entirely satisfactory for most installations and the effort required to get a finer adjustment than this is seldom worth the trouble.

Polarized relays, such as the E. D., usually have a wider operating range as their magnetic characteristics discourage adjusting operating points closer than about .5 ma.

With the Neomatic, adjustment settings are critical. The clearance and gap settings must be extremely close but excellent operation may be obtained if patience is exercised. The use of a feeler gauge is recommended to obtain the precise settings required for satisfactory pull-in and drop-out values.

Relays which have rugged contact arms and precision pivots (Sigma 4F or 5F, Neomatic, E. D.) will hold adjustment through considerable shock and vibration, but some which have floating type armature pivots and less sturdy

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## About Relays

(Continued from page 25)

must be raised. This should be done by increasing the spring or magnetic tension slowly until the armature releases. This tension increase changes the previous pull-in adjustment and to restore it requires that the original gap setting be reduced. Reducing the gap narrows the operating range by raising the drop-out point and lowering the pull-in point and compensates for the increased tension. The final adjustment requires slight juggling back and forth between tension and gap settings to bring relay operation within the receiver current range.

It should be noted that the current change of a receiver may differ when checked at close and long range, with some receivers more seriously affected than others. The relay adjustment should fall within the range between idling and signal-on current values noted during an extended distance check, and the operating points should be at least .2 to .3 ma from the extremes of current change. This will help to insure that good relay action will be had at the time reliable operation is needed most—when the model is far away and must be brought back.

Some relays are not fussy and may operate with large or small gaps. But if a large gap is used, a weak tension adjustment results because with increased distance from the coil core less power is available for pull-in. A small gap, on the other hand, permits a strong tension adjustment since magnetic power is greatly increased closer to the coil core. With small gap and good tension the relay is less likely to be affected by vibration or small changes in current and relay operation with a positive clicking

contact arms are likely to experience adjustment changes during use unless some simple modifications are made. It is recommended that the latter type relays have added between the coil core and the armature a piece of Scotch Tape, tissue paper, or cellophane to prevent these two from touching directly. During bench checks this may not seem necessary, but under vibration the play in the armature mounting has been known to cause sticking and erratic operation by permitting the magnetic surfaces to touch. If cellophane or tissue is used, it may be held with cement but should be perfectly flat so that it does not interfere with free armature action or cause excess clearance in the pull-in position.

Further improvement can be made to Kurman and similar relays with thin contact arms, if wire or brass strips are soldered to the arms to stiffen them and provide more rigid support. Also, if the relay uses a small cylindrical coil spring, unintended adjustment changes can be prevented by securing the end of the coil at the adjusting lug with cement. Just a dab does the job—too much may interfere with spring action, but just a little keeps the spring from slipping around with resultant adjustment variations.

Similarly, with the Neomatic, a dab of cement inside the notched coil core will secure the tiny leaf spring which otherwise has a tendency to slip out of position. (Some Neomatics use a coil spring and no gluing is required.)

Relays which can be reliably operated at .1 ma pull-in or less usually have a large coil with a resistance of at least 5000 ohms, a balanced armature, precision pivots and sturdy contact arms. Close adjustment between pull-in and drop-out points is also made possible

(Continued on page 91)

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**AIR NOTES**

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CAPITAL AIRLINES placed order for British Vickers Viscount four-turbo prop transports. Initial firm order is for three aircraft with an option for 37 additional. . . . TWO SUPERSONIC aces, Major Charles E. Yeager, USAF, and Miss Jacqueline Cochran were awarded the Harmon International Aviation Award for their achievements as world's most outstanding aviator and aviatrix. Presentation was made by President Dwight E. Eisenhower at the White House. . . . RUSSIA has been delivering a number of Yak-23 jet fighters to its satellites. The airplane is a souped-up version of the earlier Yak-15, powered by a Russianized-Royce Derwent. Said to be more maneuverable at 25,000 ft. than the Republic F-84E Thunderjet because of lighter weight; it is capable of taking off from relatively small fields of the satellite countries from which the MiG-15 cannot operate.

DOUGLAS F4D Skyray exceeded the speed of sound on delivery flight from El Sugundo plant to the Navy at Edwards AFB, Muroc, Calif. The bat-wing fighter attained the speed of 450 mph as it climbed past the end of the runway on takeoff. . . . IN ONE YEAR since it opened first scheduled helicopter passenger operation between LaGuardia, Idlewild and Newark airports, New York Airways has carried over 4000 passengers.

LOCKHEED'S lightweight jet fighter XF-104 undergoing test flights at the AF test center Edwards AFB, Muroc, since last March. Plane is powered by a 7200-lb.-thrust Wright J-65 Sapphire engine.

AERONCA Manufacturing Corp. has sold design rights of the well-known Champion 2-place lightplane to Champion Aircraft Corp. of St. Paul, Minn., which will begin manufacture of the plane this September. . . . A UNIQUE business flight was recently accomplished by Stanley Smith, chief design engineer of Bell Aircraft Corp., who soared from Batavia to Elmira, N. Y.

COUNTY AIRPORT at Spring Valley, N. Y., has the distinction of catering to celebrities like TV actor Wally Cox (better known to his fans as Mr. Peepers) who soloed there. Other famous students who are taking or have taken flying lessons at the field are Betsy Von Furstenburg, Franchot Tone, Mrs. Burgess Meredith. . . . PIASECKI Helicopter Corp. delivered its 339th HUP helicopter to U.S. Navy. . . . DC-3½, a hopped-up version of the old reliable DC-3, is undergoing test flights at Pan American's Brownsville base in Texas. Equipped with DC-4 type Pratt & Whitney R-2000 engines of 1450 hp each, instead of former 1200 hp powerplants, the airplane boasts an extra 20 mph speed and 600 miles additional range.

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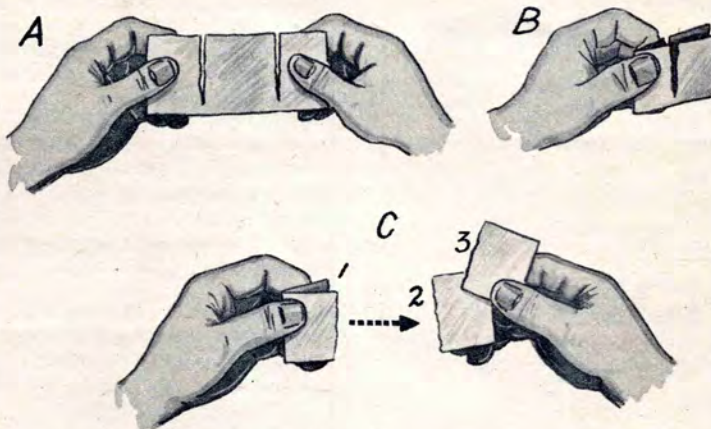
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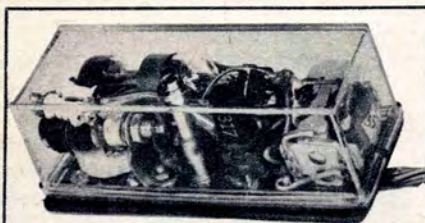
## Trick Stuff:



**PROBLEM:** To tear into three pieces, with one pull, a piece of paper which has previously been almost torn across as shown in sketch "A."

**SOLUTION:** Fold the entire piece in half with the fold through the middle of the center piece as shown at "B." Now pull apart as at "C."

—Donald E. Lowrie, Lake City, Minn.



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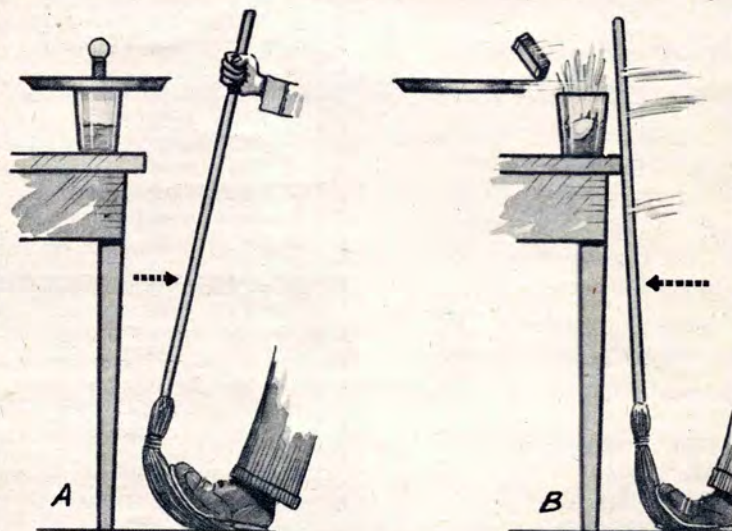
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**PROBLEM:** A glass half full of water is covered with a tin pie plate on which is placed an empty match box. On this is placed an egg as shown in sketch "A." Problem is to get egg into glass of water without touching any of the items with the hands.

**SOLUTION:** Place a broom close to the table, step on the lower part to hold steady and then pull back on the handle as shown in sketch "A." When you release it the broom handle will knock away the plate and match box, letting the egg fall into the glass of water below it.

—Paul Page, Renfrew, Ont.

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# Hobby Shop Directory

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(Continued from page 88)

by these features. A receiver with a maximum current rating of 1.5 ma or less, or which provides a current range of less than 1.0 ma, should therefore use a relay with all or most of these features. Relays without at least two of them may be satisfactory only if pull-in and current range are greater.

Proper mounting of the relay is also important, particularly with those types more affected by vibration. The Neomatic, E. D., Sigma 4F and 5F are almost immune to vibration at any current values and have operated perfectly even when rigidly mounted, but other types, usually those without precision pivots and balanced armatures, require more consideration.

The particular installation involved should govern the mounting. For instance, such a relay when used with a receiver which permits a pull-in adjustment of only 1.0 ma probably will require suspension from rubber bands to prevent vibration troubles. But the same relay used in a receiver which permits pull-in at 1.5 ma or more is not bothered much by vibration and may be satisfactorily mounted on a small pad of airfoam type rubber.

The resistance of a relay should also be correctly matched to a given receiver for best reliability. While not directly related to relay adjustment, the use of a relay-receiver installation which provides a safety margin of current range assures that once the relay is set it need not be changed. For instance, with a 5000 ohm relay in a single gas tube receiver circuit, a 10,000 ohm pot is usually provided to hold current down to about 1.5 ma.

As the tube gradually ages, the pot resistance must be reduced to maintain tube idling current above the relay pull-in setting.

With such a comparatively low resist-

ance relay, the range of pot adjustment is sufficient to compensate for considerable tube change. But if an 8000 or 10,000 ohm relay is used it soon becomes impossible to maintain high current since there is too much resistance in the circuit even with the pot set at minimum. A high resistance relay is better used in two tube receivers or in single hard tubers which provide at least 2 ma high current.

Another point is that a high resistance should not be used in some receivers because it prevents obtaining a sufficiently high current with some tubes. For instance, some hard tube receivers with a 5000 ohm relay will idle at about 1.8 ma, but with an 8000 ohm relay the idling current is only about 1.3 ma. Rather than resort to using a low pull-in relay adjustment a better procedure, when using such a receiver with a high resistance relay, would be to use a higher-current tube, or higher B voltage. The idea is to match relay and receiver in a combination that provides a high enough current for reliable relay operation without resorting to delicate adjustments or exceeding the tube rating.

Some special type relays may require other considerations and a slightly different adjustment procedure due to unusual design and construction, but practically all may be operated with complete reliability if limitations of the type are understood and provided for. With correct application for a given current range and with proper adjustment, little difference between relay types is noted from a reliability standpoint.

A real understanding of these relationships pays dividends in permitting the use of smaller, lighter or cheaper relays than might be otherwise considered practical, without sacrificing the most obvious payoff in terms of trouble-free radio control operation.

## Hobby-Model World

(Continued from page 82)

**WAGA Jr. High Point Control Line**, Buddy Medlock, Atlanta, Ga.; **WAGA Jr. High Point Free Flight**, Phillip Hartman, Lake Worth, Fla.; **Arvin Industries Senior High Point Control Line**, Walton Pyron, Decatur, Ga.; **Arvin Industries Senior High Point Free Flight**, David Warren, West Palm Beach, Fla.; **Delta Airlines Open High Point Control Line**, Tommy Baker, West Palm Beach, Fla.; **Delta Airlines Open High Point Free Flight**, H. C. Gauger, West Palm Beach, Fla.

One of Atlanta's local model clubs made such a fine showing at the Southeastern this year that we feel some word should be said in their behalf. The Cascade Beecher Model Club with a membership of over 30, the majority of whom are freshmen and juniors, brought home nearly one-third of the competitive trophies presented at the meet. We feel that if more clubs worked closer with their younger groups, as this club has, there will always be good modelers coming up to help push this fine hobby.

The Cascade Club is made up of mostly control-line flyers, with only a few exceptions. Every Sunday afternoon groups of this club gather at two different flying sites. The Stunt and Sport flyers have a nice smooth grass field adjoining one of Atlanta's city golf courses. The Speed boys have the use of a smooth concrete parking lot where there are facilities for pylon flying. This is a very busy place on Sunday afternoons, winter or summer.

A group of flyers from this Club has just returned from Jacksonville, Fla., where they won 11 out of the total 32 trophies awarded at the meet. "Hats off" to a hard-working club. Remember, work with the young boys. —R. H. Elliott



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# JAGUAR

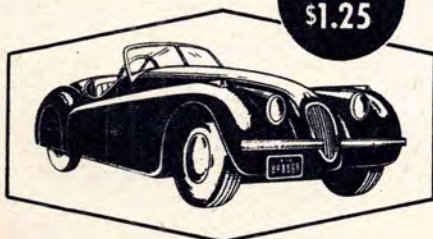
EASY TO BUILD ACE MODEL KIT

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Buy your kit now! Don't delay! Build an authentic scale model of the sensational English Jaguar Car that holds world's records galore. The ACE simplified parts, mostly ready shaped, make it easy for anyone to assemble. Complete, easy to follow scale size plans and instructions come with each kit. Here's quality, beauty and really low price.

### ACE "JAGUAR" CAR KIT No. 25R

At Your Hobby Shop,  
Toy or Dept. Store



KIT  
COMPLETE  
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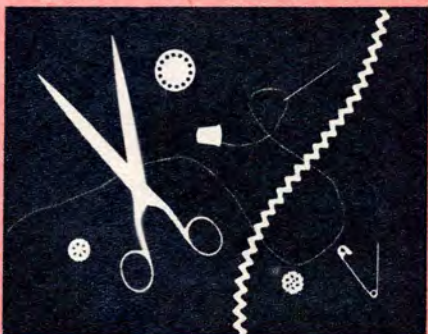
First OK Cub model airplane engines in 1937 were delivered to hobby dealer Ed Guth of Syracuse, N. Y. (right). Developed by Charles Brebeck, over a million OK engines have been sold. Now, his latest creation, Silloo Oil Painting Sets, using silhouette method (no numbers) make their debut with an initial shipment to Mr. Guth. Silloo sets sell for \$2.98 per set.



Flyboy is a remarkable training aid or toy—depending upon how air minded you are. Those with background in aviation will marvel at how accurately you pilot the model from take-off to landing. You bank, turn and land this F-84-like jet model by means of throttle control and control stick. \$7.95 post-paid (with batteries) from Airtoys, Box 5904-H5, Bethesda, Md.



"Photograms—How to Make Them" is the title of an interesting little booklet available at no charge from the Sales Service Division, Eastman Kodak Company, Rochester 4, N. Y. Photograms are pictures made without a camera, by direct exposure of opaque or translucent objects on photographic paper. The first photogram was made in 1727! Booklet gives complete details, many suggestions.



UP TO 100% TRADE-IN ALLOWANCE

1. We will allow 33 1/3 trade in allowance for ANY old engine toward the purchase of any brand new engine. Send trade in and check or money order for balance. C.O.D. orders accepted.

2. You may have an unusually nice engine or R.C. item to swap. Perhaps we can trade you a new engine even for it or give you 1/2 off in any case. Drop us a card describing what you have and what you want.

3. Replies, orders, acknowledgments by return mail. 24 hour service.

4. Send 10c for next four copies of our used engine lists, used R.C. and what have you.

| ENGINES                    | LIST LESS 1/3 | ENGINES                 | LIST LESS 1/3 |
|----------------------------|---------------|-------------------------|---------------|
| Allyn Sky Fury .049 \$4.95 | \$3.37        | McCoy 19 R.H. . . . .   | 12.95 8.65    |
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| Atwood Outboard. . . . .   | 9.95 6.62     | McCoy 29 R.H. . . . .   | 16.95 11.22   |
| Atwood Inboard. . . . .    | 3.75 3.34     | McCoy 60 R.H. . . . .   | 24.95 16.70   |
| Elf Twin Glo. . . . .      | 21.50 14.34   | O.K. Cub .099. . . . .  | 6.95 4.64     |
| Elf Twin Ign. . . . .      | 24.50 16.20   | O.K. Cub .14. . . . .   | 7.95 5.30     |
| Elf Four Glo. . . . .      | 45.50 30.34   | O.K. Cub 19. . . . .    | 8.95 5.97     |
| Elf Four Ign. . . . .      | 49.50 33.00   | Space Bug. . . . .      | 6.95 4.64     |
| Fox 19. . . . .            | 12.50 8.34    | Space Bug Jr. . . . .   | 3.95 2.64     |
| Fox 19 2 Speed. . . . .    | 13.50 8.99    | Thermal Hopper. . . . . | 6.95 4.64     |
| Fox 25. . . . .            | 12.50 8.34    | Veeo 29. . . . .        | 14.95 9.97    |
| Fox 25 2 Speed. . . . .    | 13.50 8.99    | Veeo 31. . . . .        | 14.95 9.97    |
| Fox 35. . . . .            | 14.95 9.97    | Veeo 35. . . . .        | 14.95 9.97    |
| Fox 35 2 Speed. . . . .    | 17.45 11.62   |                         |               |
| Fox 39. . . . .            | 14.95 9.97    |                         |               |
| Fox 39 2 Speed. . . . .    | 17.45 11.62   |                         |               |
| Fox 59. . . . .            | 22.50 15.00   |                         |               |
| Fox 59 2 Speed. . . . .    | 24.00 16.00   |                         |               |
| K & B 15. . . . .          | 10.95 7.30    |                         |               |
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- IF YOU FLY CONTROL LINE MODELS, don't stand within 500 feet of any power, phone or light lines!
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## MODEL AVIATION SAFETY COUNCIL

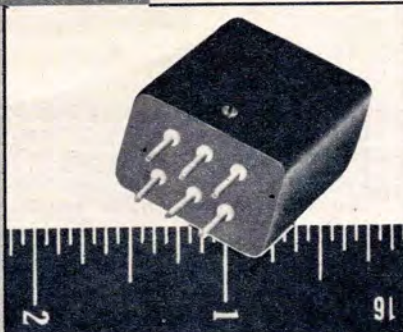


# SHOWCASE

**Subminiature relay**, said to be most sensitive in production, is available from American Telasco, Huntington, N. Y. The P-100, fully guaranteed, is priced at \$7.95. Weighs, 1 oz.; dimensions are 1-3/16 x 7/8 x 11/16 inches; resistance, 3,500 ohms; sensitivity, 20 milliwatts. Reaction time, 1/200 second. Six-pin plug in plastic case fits laminated socket supplied with the relay.

**First commercially available** Geiger counter employing a patented printed circuit is Model GC-238 Prospector for radioactive ore prospecting. It's sold by the Radiac Co., 489 Fifth Ave., New York City 17, for \$84.50. You won't notice the price should you stumble on some of that 10% uranium ore which brings \$1,694.50 a ton. Because of printed circuit unit measures only 3 x 4 x 5 1/4 in.

**Grand gift** for any air-minded young man is Revell's Trio Plane Kit of three famous jet fighters, the Lockheed Starfire, Chance Vought Cutlass and Grumman Cougar. In addition to these three assembly sets of plastic parts, kit contains 3 display stands with swivel for use on flat surfaces or each may be attached to a wall. Colored insignia decals furnished. The kit-of-3 sells for \$1.98.



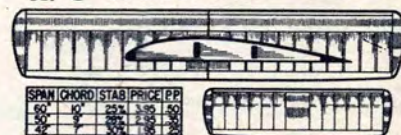
## NEW R/C WHEEL NEWS!!



### FOUR NEW SIZES

2 1/2" dia...\$2.00 3" dia...\$2.25  
2 3/4" dia...\$2.25 3 1/2" dia...\$2.50  
(Hard Maple brass bushed hubs)  
3 1/2" dia. DURAL HUB...\$3.50  
Price per pair Postpaid. Singles at half price. Tire-on-Hub Guarantee. Large air volume bouncy tires your best protection.

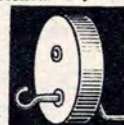
## R/C WING-STAB KITS!!



"It's a timely idea!" You design and make your pet fuselage without wasting time on wing and stab. Ribs die-cut. Edges shaped and notched. Try a set today! Please include Postage.

## 5-1 R/C WINDER

Ever find yourself short winded? 1 1/2" Dia. gear case easily fits in your pocket. \$1.25 P.P. 1952 and 1953 YEAR BOOKS can help you very much. Give them a try. \$1.00 each. P.P.



## JAP TISSUE

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## MODEL AIRCRAFT COMPANY

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## NINE NEW OUTBOARDS



Chris-Craft's 18' Outboard



Chris-Craft's 17' Outboard

Nine new outboard construction kits now available at all dealers. All an inch to the foot scale or larger. Actual large boat construction, framed hulls planked. Each kit complete with cement, decals, metal fittings, blade, sandpaper etc. Chris-Craft's 21" Monterey Cabin Express Cruiser at \$3.95. Chris-Craft's 17" Speed Boat at \$3.95. Chris-Craft's 18 foot Express, 18" long at \$3.95. Chris-Craft's 14" Hornet runabout, 17 1/2" model at \$3.95. The new 16" "APACHE" conventional step hydroplane at \$2.95. Chris-Craft's 28" Cruiser, 25" Express, 21" Sportsman, 21" Express now show outboard motor installation as well as inboard. WRITE for literature on 18 boat construction kits —\$2.95 to \$9.75, sixteen-inch to thirty-five-inch models.

## DUMAS PRODUCTS

2114 S. Alvernon, Rt. 8, Box 953, Tucson, Arizona  
1944—World's largest manufacturer of power boat kits—1954

## TIME IT!



### YOU DESERVE AN ACCURATE TIMER

The TIMIT (pronounced time it) incorporates modern design along with years of practical model engineering experience. Easy to install, light in weight (approx. 1/2 of an ounce), simple in operation, it has a needle type adjustment for greater dependability and accuracy. The TIMIT can be adjusted from 0 seconds to 2 minutes with a slight turn of the adjusting screw to give you "split second timing." It will retain its setting for flight after flight.

The TIMIT is the first in a line of new products by Lud Kading, designer of the Infant and other engines. It is proven the most accurate and dependable flight timer you can install in your plane.



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COMPTON  
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MOST BEAUTIFUL OF ALL PROFILES

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\$2.95

KING OF STUNT  
A LION TAMER IN 40" CONTROL LINE MODEL; CLASS B-C  
COMBAT

EASIEST IN ITS CLASS TO BUILD!!!



COMPLETELY PREFABRICATED! 27" Span A-B only \$1.95



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- NO KIT CONTAINS BETTER MATERIALS!!!
- ALL BALSA GRADE AAA!
- HARD BALSA HAND SELECTED FOR ALL STRESS AREAS!
- TOUGH FLYWOOD PARTS!
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- NO KIT CONTAINS BETTER WORKMANSHIP!!!

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P. D. Q. PRODUCTS CO. MILLVILLE, N. J.





**\$2.95 EACH**  
PLUS 25¢ POSTAGE

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A complete line of Korean and World War II battle tanks by MERCURY. Simple construction from full-size plans. Build authentic models for your den or library. SCALE: 1 inch equals 2 1/4 feet.

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920-AIO UTICA AVENUE • BROOKLYN 3, N. Y.



## Ready For TAKE OFF

Get your hobby sales off the ground this year. One order to Margo-Kraft will fill your airplane kit and supply needs. Your orders will be on the way to you within 24 hours. A bigger Margo-Kraft Sell-lection means more sales for you.

Write now on your letterhead for Margo-Kraft's new 1954-55 giant 246 page catalog. It's loaded with illustrations of model planes, propellers, engines and accessories—in fact, everything you need.

**WHOLESALE AND DISTRIBUTORS**  
**MARGO KRAFT.**

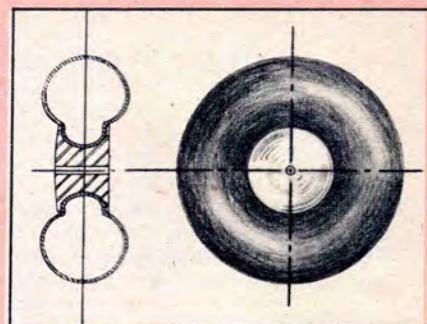
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419 S. 6th St., Minneapolis 15, Minn.

# HOBBY



An accurate, metal model of a famous imported automobile can be assembled from Doepke Mfg. Co.'s "MT" Sports Car Kit in a short time. Modeled after famous MG, the Doepke assembly set makes into a 90% metal, 14-in.-overall, 1/16th scale car. It's kit #2017 and it sells for \$10.95. Although no motor is supplied, concern says car can be motorized using standard small scale motors.

Heavy duty, balloon type wheels suitable for radio control now offered by S&S Machine Co. & Model Works (84 Thomas St., Paterson 3, N. J.) at \$2.95 per pair. Tires measure 3 1/4 in. in diameter, are guaranteed against blowouts and are made from pure black rubber. Weigh less than three ounces. As "gas" models grew smaller it became more and more difficult to get big wheels for R/C craft.



Chrome-plated steel rims and spokes, caliper hand brakes, three speeds are all features of the Regal English-made bicycle imported by Liberty Bicycle Co., 135 Liberty St., New York City 6. Priced at \$47.50, each Regal comes equipped with tools, tool bag, air pump and kick stand. This streamlined, lightweight is available in all sizes, models and colors. Catalog #AL is available from Liberty, no charge.



## You Ask . . . we answer

**.09 Size . . .** Could you please tell me what is the difference between ".09" engines and the ".099" engines. Read your mag all the time but it is hard to get out here.

Bill Wiese, Tipton, Kans.

• There is no difference between an .09 cu. in. engine and an .099 cu. in. engine in normal use. .09 is simply an abbreviation. Technically, however, the .099 could be the larger of the two.

**National Air Races . . .** I am interested in the articles I have read about the annual National Air Races and was told that I could procure information pertaining to specifications, rules, regulations, etc., by writing to you for them. If possible, I would appreciate receiving literature about this event, how to qualify, specifications, limitations, etc.

Larry L. Talley, Denver, Colo.

• The National Air Races have been discontinued. Originally they were organized and operated by the Air Foundation of Cleveland, Ohio, under the rules and regulations of the National Aeronautic Association, Washington, D. C.

**Grumman Tigercat . . .** I am very interested in the Grumman F7F Tigercat. I cannot find

much data on this plane, and would appreciate it if you could tell me the speed, weight, dimensions and armament. Is it still in operational duty with the Marine Corps? Could you send me a three-view drawing of it?

D. W. Boose, Baltimore, Md.

• The Grumman F7F-IN Tigercat had a span of 51'6", length was 45'5", empty weight approximately 10,000 lbs., top speed 425 mph and armament was four 20-mm cannons. The plane is no longer in service.

**Stits Playboy . . .** I am very much interested in the building of a home-constructed airplane. There is one I had read about but the address of the manufacturer was not given. It is Stits A-3U Playboy, a single-place sport plane with an 80 hp engine. Could you give me their address?

John Guy, Highland Park, Mich.

• The address of the builder of the Stits Playboy is: Ray Stits, P.O. Box 3084, West Riverside Airport, Riverside, Calif.

**Jet vs. Prop Fighter . . .** I have been interested in aerobatics for several years now. A few years ago I read of a maneuver used by propeller-powered aircraft in combat with jet-powered aircraft. The article said that the propeller-powered aircraft used the advantage it had over the jet powered aircraft. Would like to know how it is done and what the advantage is.

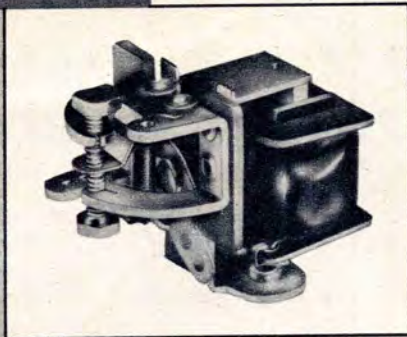
Bob Brown, Box 529, Meridian, Calif.

• We do not know what maneuver you have in mind, but during World War II some German Me 262 jet fighters were



# SHOWCASE

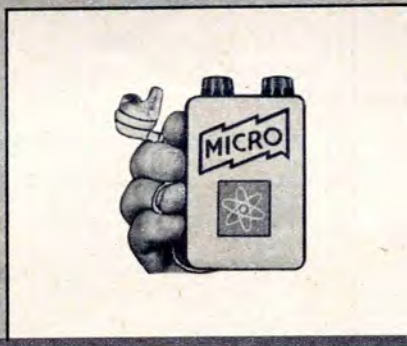
**Super sensitive, adjustable contact radio control relay** now offered by Berkeley Models as Part No. DE-304. Priced \$7.50, and specifications are as follows: 5,000 ohms resistance, weighs less than two ounces; designed for high speed operation; equipped with adjustable contacts; 11 milliwatts sensitivity; features balanced, low-friction armature. Berkeley reports developing took two years.



**New Lionel catalog** of model electric trains is yours for the asking. Send 10¢ to Lionel Corp., 15 East 26th St., New York 10, N. Y. Among many new locos and cars this year Lionel offers the Fairbanks-Morse diesel with two motors and Magne-Traction in "O" gauge. Also new is a magnetic portal gantry crane, section gang car, cement car, "reefer," plus many new "streamliner" passenger cars.



**Powerful, portable** and can be assembled in one hour—that's the way Electronic Miniatures, Manteo N. C., describes its Micro pocket radio kit priced at \$3.99 postpaid less batteries and headphones. Runs on 2 dry cells. Batteries are extra at \$1.49. Tiny hearing aid ear-set is also available from Electronic Miniatures. Size of pocket radio is listed as "smaller than many hearing aids."



shot down by our propeller-driver fighters such as the P-51 Mustang. The "51" was capable of tighter turns than the jet and had better aerobatic characteristics. It could turn inside the "262" and would occasionally catch the German jet when its pilot was not alert.

**Friendly Wager . . .** My friend and I have a friendly wager on the ramjet engine. I state that it has to be going at least 300 to 400 mph before it will cut in or can be started. My friend states the figure is 150 to 200. A little money is involved so would you kindly settle the bet?

J. C. Kelly and W. Wilson, Norfolk, Va.

● The ramjet does not require a speed of 300-400 mph to get started, considerably less air velocity is needed, probably around 150 mph. As an example let's take the Hiller Hornet helicopter powered by two ramjet engines located on wingtips. To get them started the rotor must be rotated at 150 rpm. The rotor diameter is 27 feet. Multiplying the diameter 27 by 3.146 (pi.) we get the circumference of 84.8 ft. or distance traveled by the tip of rotor blade at 150 rpm. This comes out to a distance of 13.72 ft. per minute or approximately 2.5 miles per minute, equaling 150 mph. However, full power for take-off is not generated until the blades rotate at 500 rpm, at which time the tips and therefore the ramjets travel at a speed of 480 mph.

**Planes with 75-mm Cannon . . .** Will you please send the name of all planes to carry a 75-mm gun or bigger?

David Livingston, Polo, Ill.

● Just prior of World War II an experimental installation of a 75-mm cannon was made on a Douglas B-18 at Bolling Field, Washington, D. C. During the war the B-25G model of the North American Mitchell bomber was equipped with a 75-mm cannon as well as the Douglas A-26 Invader. As far as we know no other plane types were armed with 75-mm cannon or bigger, though quite a number carried guns of 37-mm and 40-mm caliber.

**WW II Planes . . .** I would like to know the manufacturers of these World War II planes: XP-54, XP-55, XP-67, XP-77 and the XP-75—and their addresses.

David Garrison, Brooklyn, N. Y.

● The XP-54 was built by Consolidated-Vultee Aircraft Corp.; it was a twin boom single seater fighter powered by 2300 hp Lycoming engine.

XP-55 was built by Curtiss Airplane & Motor Co.; a canard-type fighter with a 1275 hp Allison engine.

XP-67 was built by McDonnell Aircraft Corp.; twin engine fighter with pressurized cabin, looked somewhat like the McDonnell Banshee.

XP-77; built by Bell Aircraft Corp., a light all-wood fighter powered by 12 cyl. inverted "V" air-cooled Ranger engine.

XP-75; built by Fisher Body, Div. of General Motors, Corp.; large single-seater fighter with engine behind pilot driving a contrarotating propeller in the nose. Engine was a 2000 hp 24 cyl. liquid-cooled Allison.

Addresses of the above manufacturers can be obtained from the 1954 Air Trails Model Annual.

**New** by Monarch

3<sup>95</sup>

**bambino**  
FOR ENGINES — .099 to .15  
WINGSPAN — 24 inches

Another MONARCH masterpiece! Perfection of design and outstanding PRE-FABRICATION make BAMBINO a "must" for all. A truly magnificent model — refreshingly different in every trim and beautiful line. A DE LUXE kit with formed metal MONO-STRUT, SPINNER, bubble canopy, rubber wheels, huge assembly illustrations, etc.



**GOOD NEWS**

5<sup>95</sup>

A stunning new model — perfect for all sport flying and team racing. Handsome, sleek, and trim in every racy line — from any angle. Nothing finer exists — for here is design and PRE-FABRICATION at its greatest. Contents are lavish — formed aluminum struts, bubble canopy, rubber wheels, and much more.

at your dealer  
by mail add 30¢

FOR ENGINES — .19 to .35  
WINGSPAN — 30½ inches

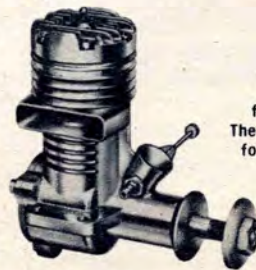
MONARCH MODEL AIRCRAFT CO. Inc.  
Brooklyn 33, N. Y.

*In a class  
by itself!*

**FOX**

the finest name  
in model engines

When you fly a FOX you know you fly the finest . . . the engine that outperforms all others. To complete your patterns with snap and precision . . . to enjoy the thrill of superior performance insist on a FOX engine.



Illustrated is the famous FOX 35 . . . The National's winner for 5 straight years!

FOX MANUFACTURING CO., INC.  
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## MAKE MONEY WITH LAMPS

Assemble and sell these beautiful Western Covered Wagon Lamps From The Desert. Made from the Chola cactus. Gorgeous western scenes on shade. Complete Kit only \$4.49 postpaid. Suggested resale \$6.95 assembled. 10"x8 1/2".

Sunland Products, Box 921, Tucson, Ariz.

New!



## 1/4 SCALE Miniature Snowshoe Kit

- 13" x 3 1/2" size
- 2 pre-bent drilled white ash snowshoe frames
- 4 drilled white ash thwarts
- 4 copper rivets with burrs
- 2 punched calfhide toe straps
- 38 feet of fine goatskin lacing
- complete illustrated instructions

This unique, quality kit makes an interesting model pair of snowshoes of the type made today by Indians in Maine.

\$3 Postpaid

**PRIDE MODELS**  
16-D CEDAR STREET, BINGHAMTON, N.Y.



**K&O Speedster Kits 4.95 to 11.95—The Fleet Line Ready-Built Boats 4.95 to 10.95—Electric Inboard Motors 1.25 to 4.95—Electric Outboard Motors 2.95 to 4.95—Electric Drive Units 1.95 to 4.95—Gas Engine Screw Sets 3.95 to 7.95—complete line nickel-plated Model Boat Fittings.**

AT YOUR HOBBY SHOP, TOY OR DEPT. STORE

**K&O Models, INC.**

14721 LULL ST., VAN NUYS, CALIF.

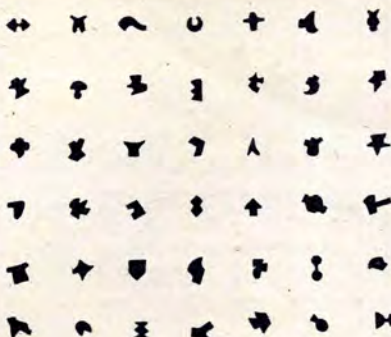


AT LAST, you can get real 'Air Force's' plane recognition slides—just released!

We have just gotten a limited shipment of formerly restricted Air Force aircraft recognition slides used to train U. S. airmen. Fighters, bombers, observation ships and other craft are shown from every angle . . . at a distance as well as close in. Many views of enemy planes were taken by the gun-camera of our own fighters in aerial dogfights during World War II. You can learn how to recognize various planes by studying these slides and help in Civil Defense or future service in the Armed Forces. Boxes of Jap, German, British and American planes. On all orders of 100 slides or more we will send you . . . FREE of charge a handsome pocket-size Mini-Viewer of mahogany plastic, with magnifying lens, light diffusion glass and quick change slide arrangement.

Introductory offer of 25 slides only 60 slides for \$1.95  
With 100 slides at only 200 slides with Viewer, \$3.95  
\$2.95 you get pocket size 300 slides with Viewer, \$4.95  
Mini-Viewer FREE 500 slides with Viewer, \$5.95  
SEND order and money DIRECT to:  
C & H SURPLUS SPECIALTIES CO., 428 W. Junco Ave., Milwaukee 3, Wis.

## What's Your Hobby?



## Here's One With a Punch!

A friend of mine collects holes . . . tiny holes in paper tickets; the punch marks of railroad conductors.

It never dawned on me until I began to look over this collection of "nothings" that this business of a conductor snipping a hole in your ticket or transfer had so much behind it. It's the guy's "signature" that can identify him across the country and beyond; a trademark as personal, exclusive and as valuable as the name on a bottle of "Coke."

Each little hole is designed for the exclusive use of the owner of the punch that makes them. They are his alone and registered in his name with the main office of the transit company for which he works. Hand-made by a few experts, these punches must cut the particular design perfectly, every time, with no rips or tears. If they do not punch perfectly they might make a slightly different design; that of some other employee, and hence commit an unintentional "forgery."

The manufacturers of these very special punches submit big sheets of designs for these "holes" to the various punching organizations; railroads, bus companies, etc. From these design sheets the company picks the designs for their employees' use. Once a design has been selected, it is voided, so there is never any duplication. By combining any set of designs with another there are literally thousands—even millions—of possible silhouettes available.

The metal punches themselves are made to almost microscopic tolerances, tested and retested for clear, sharp and complete cutting efficiency. The paper bit punched from the ticket must be cut out completely every time, not only to keep the design outline sharp and clear, but to save time. (Cont. on next page)

Now . . . What's your hobby? Is it of special interest to mechanically minded young fellows? If so, tell us about it! Send photographs, details on how you got started, to "What's Your Hobby," Air Trails HOBBIES, 304 E. 45th St., New York 17, N. Y. We pay you \$25 for each contribution published (typewrite your comments, include glossy photographs).

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While every precaution is taken to insure accuracy we cannot guarantee against the possibility of an occasional change or omission in the preparation of this October 1954 index.

## Hobby Club Emblems



**Southern Calif. Model Power Boat & Yacht Assoc., Los Angeles.**

Representing most of the active model power boat operators in and around the Los Angeles area, this club is rapidly becoming known on a national scale. Group is a member unit of International Model Power Boat Association, a world-wide organization. Members build practically every type of powered craft, free-running and radio controlled. Club meets every third Tuesday of the month at 412 So. Parkview, Los Angeles. Sundays find them engaged in their hobby at Alondra Park Lake.

Send your club insignia—with info on your group. ATH will pay \$10 for each emblem and report used here. Type data and send only printed emblems—no sketches.

The punches are so expertly made that many of them stay on the job for nearly fifty years, sometimes even being handed down from father to son after the older man's retirement, cutting millions of tickets without a slip or requiring a serious overhaul. Each design is made in two punches, one as a working cutter and the other as a spare, should the other require repair or checkup. Some trainmen occasionally sharpen their own punches with a few cuts through fine emery paper to remove any slight burs that might form on the edges of the cutter to mar its efficiency.

There are two basic kinds of these punches, the "receptacle punch" that catches the little bits of cut-out paper in a compartment that requires emptying but once a day or so when full, and the "open sight punch," so designed that the user can see exactly where he is cutting on the ticket. The latter is employed where the cut must be made exactly within a small square or area on a multiple ride ticket that is used by the holder over several months.

A majority of the transit company's precision tools cut just "shapes" or abstract designs, but sooner or later you'll run across one that produces the outline of some familiar object. Of the six different conductors who punch my own railroad multi-trip ticket I find but one who cuts an object—a silk hat. Don't let the design of the chap's cutter influence your ideas as to his personality . . . a fellow who is violently allergic to horses cuts a horseshoe, one who drinks nothing stronger than milk cuts a wine glass and a very peaceful sort of guy chops out a very neat little tomahawk.

—C. B. Colby

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Yes, sir! MORE of the Finest in 1/2 A. With the New Look on the Dil-Bod and more SNAP in the SNAPPER, those of you who have been unable to obtain one until now will receive the surprise of your life.



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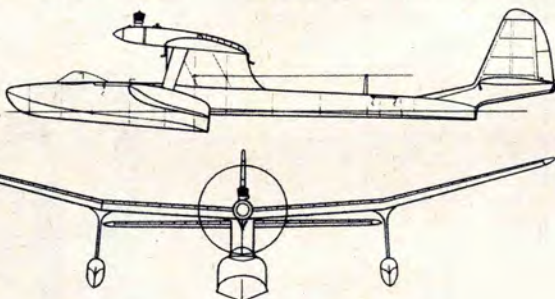
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Proven performance on the original test models include: First International Radio Control Flight; Fourth place in a field of seventy in the Mirror Flying Fair (The first R.C. contest for both Struck and the "Sea-Cat"); First in Radio Control at Screamin' Demons Long Island Sound Hydro Championship; Second in PAA-Load at the same contest; and Precision flights carrying over a pint of fuel at the First "World Model Air Olympics."

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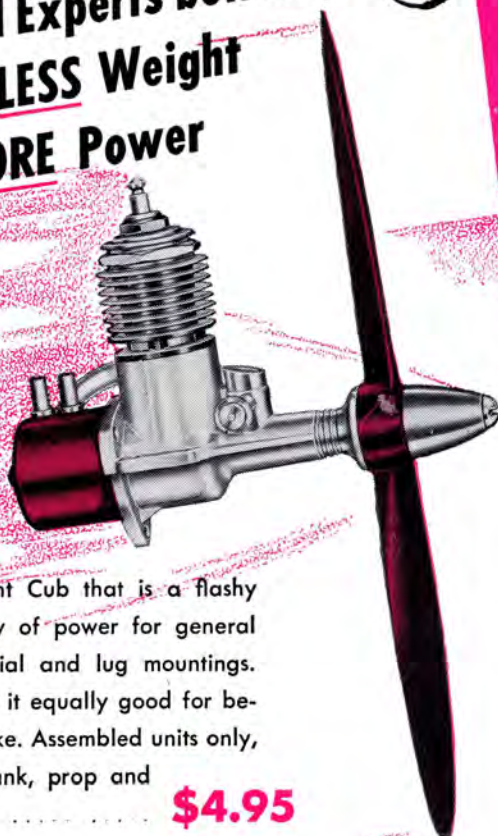




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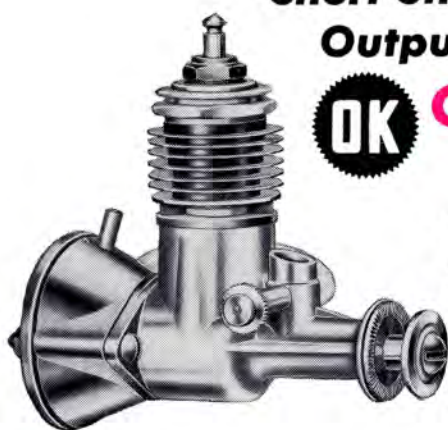


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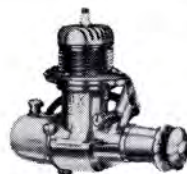
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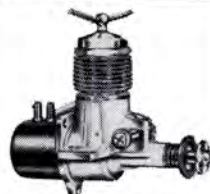
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